

Cornell University Library
Ithaca, New York

BOUGHT WITH THE INCOME OF THE
SAGE ENDOWMENT FUND
THE GIFT OF
HENRY W. SAGE

1891

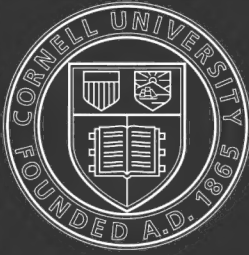
RETURN TO
ALBERT R. MANN LIBRARY
ITHACA, N. Y.

Cornell University Library
QL 696.G8B66

The natural history of the cranes.



3 1924 000 102 149 mann



Cornell University Library

The original of this book is in
the Cornell University Library.

There are no known copyright restrictions in
the United States on the use of the text.

THE
NATURAL HISTORY
OF THE
CRANES.

Ornithological Works issued by W. B. TEGETMEIER.

BODDAERT'S TABLE DES PLANCHES ENLUMINÉES D'HISTOIRE NATURELLE.

Reprinted verbatim et literatim from the exceedingly rare Original Edition of 1783.

"A reprint of Boddaert's excessively rare work, 'Table des Planches Enluminées,' which ornithologists are constantly requiring for reference, has been undertaken by Mr. Tegetmeier, F.Z.S. The reprint, is a *verbatim et literatim* copy of the original, every word, line, and page being reproduced in fac-simile, even to the typographical errors of the old edition."—*The Ibis*.

The reference to Boddaert's work has hitherto necessitated a great waste of time, owing to the absence of an Index, consequently each species had to be sought for amidst 1200 others. Mr. TEGETMEIER proposes to issue the few remaining copies of his reprint, with a full index of the genera and species. The cost of the work complete will be, to subscribers, 6s. The Index alone may be obtained by the original subscribers at 1s. in wrapper. Application may be made to Mr. PORTER, 6, Tenterden-street, W.C.; or, THE EDITOR, Finchley.

REPRINT OF

MOORE'S COLUMBARIUM.

Reprinted Verbatim et literatim from the Original Edition of 1735. With a Notice of the Author.

The "Columbarium" of Moore is the earliest English work giving a description of the different varieties of the domestic pigeon. From the accuracy of its details it possesses considerable interest both to naturalists and fanciers. By its aid the former may trace the alterations produced in varieties of the same species by the most careful breeding, continued for 150 generations; and to fanciers it is known as the source from whence all subsequent works have taken their rise.

Price Two Shillings and Sixpence.

Nearly ready, price 15s., royal 4to., bevelled cloth, gilt edges.

THE SECOND EDITION OF PHEASANTS; THEIR NATURAL HISTORY AND PRACTICAL MANAGEMENT.

ILLUSTRATED WITH NUMEROUS FULL-PAGE ENGRAVINGS BY T. W. WOOD.

NOTICES OF THE FIRST EDITION:

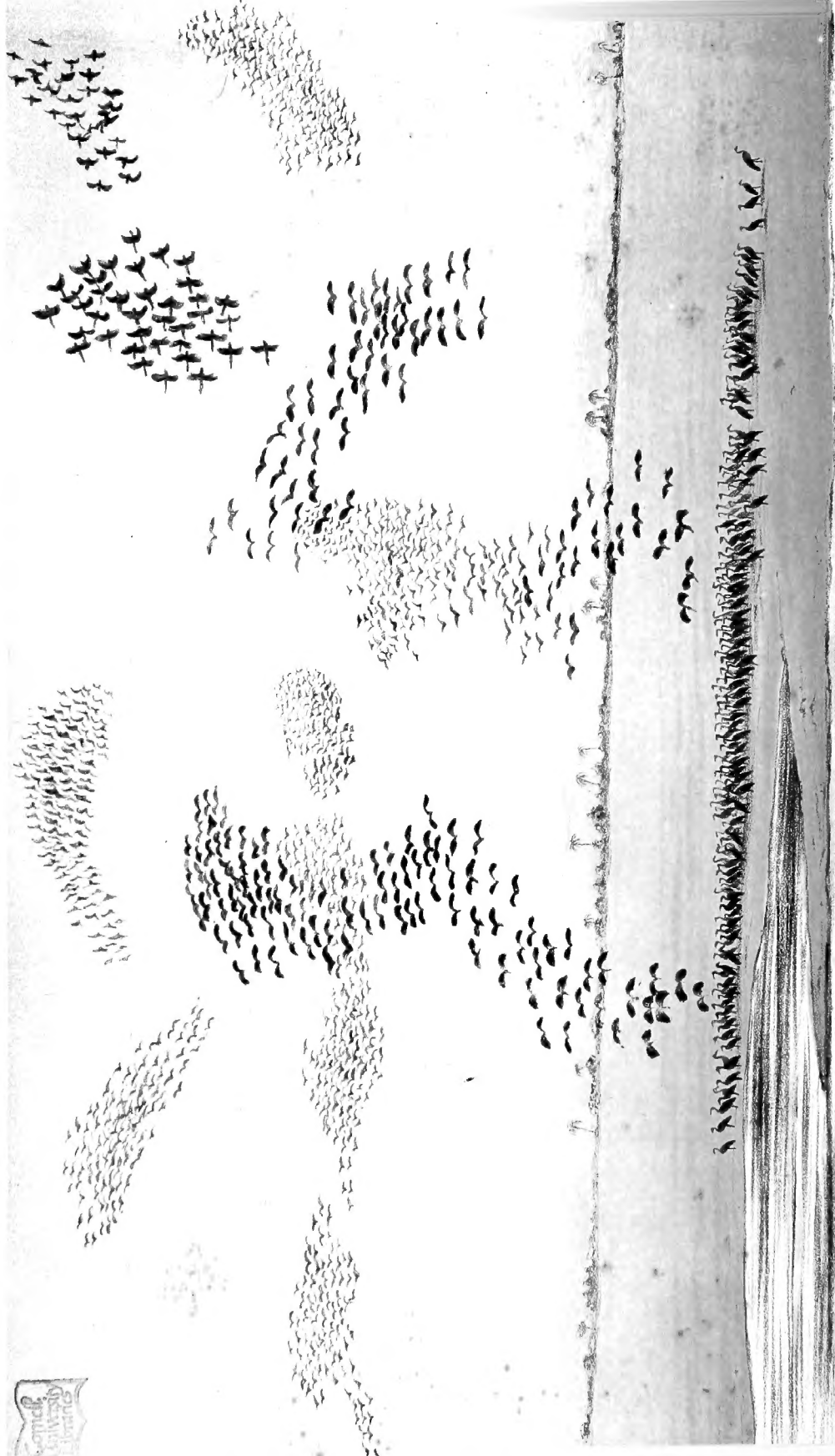
"Mr. Tegetmeier's magnificent work on pheasants. . . . Replete with practical detail, that must be most valuable to the many who spend such large sums in preserving game, and to those who have the actual superintendence of the coverts themselves. . . . This work supplies a long-felt want, and its perusal will repay any who take it up."—*Nature*.

"No one will regret that Mr. Tegetmeier's skill in bringing to bear upon any department of the history of gallinaceous birds the stores of research which he has amassed has been directed into this channel. With him for guide and mentor we may fairly hope to be spared absurd exaggerations, and to find reasonable explanations of statements about which doubt might suggest itself."—*Saturday Review*.

"We have already had reason to notice this valuable work. Mr. Tegetmeier, writing on the natural history and management of the pheasants, has conveyed an amount of amusement and information which is truly surprising."—*Lancet*.

"The work treats of general subjects relating to the hatching, rearing, and treatment of pheasants, and is replete with important details. . . . Nothing can be more interesting than the descriptions."—*Athenæum*.

HORACE COX, "FIELD" OFFICE, 346, STRAND, LONDON, W.C.



FLOCKS OF GRUS VIRGO ON THE BANKS OF THE NILE, after Sketch by Prof. Flower.

THE
NATURAL HISTORY
OF THE
CRANES.

A MONOGRAPH BY
THE LATE EDWARD BLYTH, C.M.Z.S.

GREATLY ENLARGED, AND REPRINTED, WITH NUMEROUS ILLUSTRATIONS,

BY

W. B. TEGETMEIER, F.Z.S.,

Member of the British Ornithologists' Union; General Editor of the Willughby Society.



PUBLISHED FOR THE AUTHOR BY
HORACE COX, 346, STRAND, W.C.
AND R. H. PORTER, 6, TENTERDEN STREET, W.

1881.
L L,

QL
696
G8
B66
A.380468

LONDON :

PRINTED BY HORACE COX, 346, STRAND, W.C.

PREFACE.

THE story of this volume is soon told. On the arrival for the first time in this country of a pair of the beautiful white-naped cranes of Japan, they were drawn by Mr. T. W. Wood for *The Field*, when Mr. E. Blyth, availing himself of the opportunity, published in the columns of that paper a monograph of all the then known species of the Gruidæ.

These articles were soon exhausted. I thought of reproducing them in a literal reprint, and had proceeded as far as the introduction, when Professor Newton forwarded to me a copy of his article "Crane," in the "Encyclopædia Britannica." In this he stated "an admirably succinct account of all the different species was communicated by the late Mr. Blyth to *The Field* newspaper in 1873, which, it is much to be regretted, has not since been published in a more accessible form."

This opinion confirmed me in my estimation of the worth of the work, and I endeavoured to render it of more value by the insertion of much matter that limited space had kept out of the original articles, and new information that has appeared since Mr. Blyth's death. Amongst these, I may instance the valuable contributions of the late Col. Tickell on the Indian species, Mr. Wolley's account of the nesting of the common species in Lapland, justly characterised by Professor Newton as "one of the most pleasing contributions to Natural History ever written," Dr. Cullen's account of the nesting of the Demoiselle in Bulgaria, Mr. A. O. Hume on the Asiatic White Crane, Dr. Coues on the American species, Lieut-Col. Prjevalsky's account of a new species, Mr. Gurney's description of the Southern Crowned Crane, &c., &c. These additions being more than double the amount of the original matter, I have no hesitation in placing my own name on the title-page. The added matter, whether in large or small type, is indicated by being placed in square brackets [thus], so that Mr. Blyth's original contributions are easy of identification.

With regard to the assistance I have received, without which the book would have wanted much of its value, I have to acknowledge my obligations to Mr. P. L. Sclater, who revised the whole of the nomenclature; to Professor Newton, for the loan of several sterna, and much interesting information respecting them; to Professor Flower, for the sketch of the

flocks of the Demoiselle on the banks of the Nile; to Mr. Harting, for much kind assistance during the progress of the work; above all, to Mr. F. H. Waterhouse, the librarian of the Zoological Society, for the valuable and unwearied aid that he rendered in tracing back to the original authority every synonym given in the volume, thus enabling me to correct a large number of erroneous references which have been copied by writer after writer for a century past. I was amply rewarded for the trouble taken in this matter by being able to show that the absurd title *regulorum*, applied to the Southern Crowned Crane had no foundation, the proper title being *Balearica chrysopelargus* (P. Z. S., Feb. 17, 1880).

It will doubtless be observed that the specific names employed are sometimes masculine, at others feminine (*Grus* being an epicene noun), and it has been suggested that it would be desirable to make them uniform, but by so doing I should outrage the accepted code of Zoological nomenclature, inasmuch as Gould first named one species *Grus australasianus* and Temminck another *Grus monacha*. I have therefore allowed them to remain as originally written by the first describers.

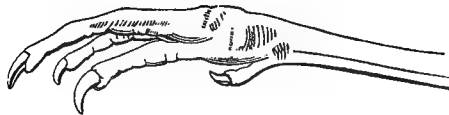
The illustrations speak for themselves. The frontispiece shows a scene which, as far as I am aware, has never before been delineated. The truthfulness of the plate of the White-naped Crane has not been excelled by the painstaking artist, who has also drawn the portraits of eight species from specimens living in the Zoological Gardens. The coloured figure of the new species *Grus nigricollis* is a fac-simile of that in the Russian edition of Lieut-Col. Prjevalsky's work. Mr. Cutler has lent me some plates from his beautiful work on Japanese ornament. The anatomical cuts, which have been drawn by myself, though coarse, are sufficiently correct to answer their purpose.

FINCHLEY, N.

Feb., 1881.

CONTENTS.

INTRODUCTION	page 1
BALEARICA	14
„ CHRYSOPELARGUS. Southern Crowned Crane	15
„ PAVONINA Western Crowned Crane.	19
GRUS	23
„ PARADISEA Paradise or Stanley Crane	23
„ VIRGO Demoiselle Crane	26
„ CARUNCULATA Wattled Crane	33
„ LEUCAUCHEN White Naped Crane	35
„ LEUCOGERANUS Asiatic White Crane	38
„ COLLARIS. Collared Crane	45
„ ANTIGONE Sàràs Crane	47
„ AUSTRALASIANUS Australian Crane	51
„ VIRIDIROSTRIS. Mantehurian Crane	53
„ AMERICANA Whooping Crane	54
„ COMMUNIS Common Crane	59
„ NIGRICOLLIS Black necked Crane	70
„ MONACHA White headed Crane	71
„ CANADENSIS Sandhill Crane	72
„ SCHLEGELII } Doubtful species	78
„ FRATERCULUS }	
APPENDIX. Convolutions in the Trachea in Birds	81



Foot of Crane *G. antigone*, showing hooked inner claw. *Vide* p. 2.

LIST OF ILLUSTRATIONS.

FLOCKS OF GRUS VIRGO	Professor Flower	<i>Frontispiece</i>
FOOT OF GRUS ANTIGONE	T. W. Wood	page vii
SACRED CRANE OF JAPAN. . . .	From Japanese drawing. . . .	13
STERNUM OF BALEARICA	W. B. T.	15
SOUTHERN CROWNED CRANE. . . .	Wm. Harvey	16
STERNUM OF GRUS PARADISEA	After Yarrell	22
HEADS OF DIFFERENT SPECIES	T. W. Wood	to face 23
GRUS VIRGO	Wm. Harvey	26
GRUS LEUCAUCHEN	T. W. Wood	to face 36
JAPANESE SPECIES	From Japanese design	to face 38
STERNUM OF GRUS ANTIGONE	W. B. T.	51
GRUS VIRIDIROSTRIS	After Wolf	53
STERNUM OF GRUS AMERICANA	After Roberts	57
GRUS NIGRICOLLIS	After Prjevalsky	to face 70
STERNUM OF GRUS CANADENSIS	After Roberts	77
VIGNETTE	After Japanese design	79
STERNA OF CRANES.	Various	82, 83, 84
STERNA OF SWANS	After Yarrell	86
TRACHEA OF CROW SHRIKE	After Payesi	88
VIGNETTE	Wallis MacKay. . . .	92

MONOGRAPH OF THE CRANES

(GRUIDÆ).

INTRODUCTION.

THE Cranes constitute an exceedingly well-characterised family of birds—so much so that nobody who properly recognises any one of them as being rightfully so designated, can possibly mistake a member of the group for any other sort of bird. Yet the appellation of crane is perversely misappropriated in many instances, so that it is difficult to understand sometimes what kind of bird is meant when the name is used. Thus in the Scottish highlands, and again in Ireland, the heron is popularly so denominated; in North and South America, Australia, and New Zealand, the white egret-herons (which are currently and somewhat contemptuously known as “paddy birds” in India) are styled cranes; and the great adjutant-stork is frequently termed “the gigantic crane” by authors who should know better than to perpetuate such a misnomer. Again, in North America, the white and sandhill cranes of that continent are sometimes respectively miscalled the white and sandhill storks; and in Australia the only crane of the country is chiefly known as the “native companion.” The name crane, like its equivalent in many languages, is derived obviously from the loud trumpeting cries for which the birds of this group are particularly noted, and may be compared to γερανος—*grus*, *grues*, whence *grue*, &c.—and the Indian appellations for different species of them, as *sáras* or *sárrás*, *kárrkárra*, *kárrunch*, &c.—always with a rolling sound of the letter *r*, and therefore properly inapplicable to birds which do not emit such cries. In general the trachea is elongated, and forms a convolution within a cavity in the keel of the breast-bone, as in the trumpeter group of swans, being thus figured at two ages in the instance of the Common Crane (*G. communis*) in Yarrell’s “History of British Birds;” but it is remarkable that this structure does not occur in the crowned cranes (*Balearica*), and (as recently shown by Mr. A. O. Hume, *Ibis*, 1868, p. 35) it is only slightly indicated

in the Asiatic White Crane (*G. leucogeranos*). Nevertheless, the crowned cranes send forth a tolerably sonorous note, but in the Asiatic White Crane the voice is described to be much more feeble than in any other species.

When uttering their loud cries while on the ground, and commonly when not seeking for food, the cranes carry themselves remarkably erect, with the head loftily and proudly raised, and the vertebral column nearly vertical. The beak, when they thus majestically strut, or rather when they stride defiantly, is pointed downward. In the act of trumpeting the neck, at full stretch, is thrown backwards, and the gaping mandibles point to the sky. They have a peculiar mode of nodding the head and expanding the wings widely when at play, meanwhile dancing about in a graceful manner, as every visitor to a zoological garden must have often witnessed. Hence the name of "demoiselle," as applied to the smallest and one of the most elegant and familiarly known of the species. In defence of their young they are fierce and aggressive, and strike both with beak and wings, quite formidably with the former, while the inner toe is furnished with a sharp hooked claw, with which a wounded bird can inflict severe tearing scratches, and must therefore be approached with caution; the same, of course, when attempting to catch hold of one. I have vainly sought, however, for a single figure in which the hooked talon is represented. They fight or defend themselves alike with beak, wings, and feet, in valorous style, which was surely known to him of old who sang of their reputed combats with the pygmies. "We have known instances," remarks Sir J. Richardson, writing of the American White Crane (*G. americana*), "of the wounded bird putting the fowler to flight, and fairly driving him off the field;" and of the same species Mr. H. Youle Hind states that "it is a dangerous antagonist when wounded, striking with unerring aim and with great force with its powerful bill. When the bird is wounded, the best way to avoid its attacks is to present the muzzle of the gun as it approaches; it will fix its bill in the barrel, and may then be destroyed without danger. Instances have been known of this bird driving his bill deep into the bowels of a hunter when not successful in warding off its blow." Like many other birds, they are clamorously noisy before rain, and in the early morning and evening. In general, it may be asserted of them that the species inhabiting the northern hemisphere are migratory, most of them pre-eminently so, some only partially; while those of the southern hemisphere are hardly, if at all, migratory. Most of the travelling species congregate in flocks more or less numerous, and sometimes enormous, to perform their seasonal journeys, and continue thus gregarious while in their winter quarters. At the seasons of migration their loud trumpeting cries are heard from vast altitudes in the air, as the flights pass over in V-like array, like those of wild geese. Major Long, writing of the American Sandhill Crane (*G. canadensis*), remarks—and his observations apply equally to other species—that;

They afford one of the most beautiful instances of animal motion we can anywhere meet with. They fly at a great height, and, wheeling in circles, appear to rest without effort on the surface of an aerial current, by whose eddies they are borne about in an endless series of evolutions. Each individual describes a large circle in the air, independently of its associates, and uttering loud, distinct, and repeated cries. They continue thus to wing their flight upwards, gradually receding from the earth, until they become mere specks to the sight, and finally disappear altogether, leaving only the discordant music of their concert to fall faintly on the ear, exploring

Heavens not its own, and worlds unknown before.

That is to put the matter poetically, while the facts of the case will be treated of in due course. Virgil writes :

Quales sub nubibus atris
Strymoniaë dant signa grues, atque æthera tranant,
Cum sonitu, fugiuntque notos clamore secundo.—*Æneid*, x. 264, &c.

And Milton :

Part loosely wing the region, part more wise,
In common, ranged in figure, wedge their way,
Intelligent of seasons, and set forth
Their aery caravan, high over seas
Flying, and over lands with mutual wing
Easing their flight. So steers the prudent crane
Her annual voyage, borne on winds ; the air
Flotes as they pass, fanned with unnumbered plumes.

These birds rise with some difficulty, running forward two or three paces before gaining the use of their wings, and during flight they extend both neck and legs, their feet showing beyond the tail-tip. On alighting they also run two or three paces. Mr. Gould, in his "Handbook to the Birds of Australia" (vol. ii., p. 291), remarks of the Australian species that :

When near the ground the action of the wings is very laboured ; but when soaring in a series of circles at such a height in the air as to be almost imperceptible to human vision, it appears to be altogether as easy and graceful ; it is while performing these gyrations that it frequently utters its hoarse, croaking cry.

Cranes of one or more species are found almost everywhere, according to season, with the exceptions of South America, the Malayan and Papuan archipelagos, and the scattered islands of the Pacific. The common European species (celebrated in all recorded time for its migrations—"the crane and the swallow observe the time of their coming") lived numerous in the fenny counties of England until driven away by the drainage of its haunts, and the ever-increasing pressure of human population ; but it is still plentiful in summer in the north of the Scandinavian peninsula, in Finland, and thence eastward, and the species of crane are nowhere else so numerous as in furthestmost Asia, where six, if not seven, species are met with eastward of Lake Baikal. It is somewhat remarkable that a peculiar species of crane inhabits Australia, as also a peculiar species

of bustard, which latter has its nearest congener in the still finer great bustard of India (which is unknown out of India properly so called), and there is no bird of either kind in the intervening countries, excepting the Indian cranes in the great Indo-Chinese peninsula. Some of the northern species extend their migrations to within the limits of the arctic circle. The fossil remains of three or four species of *Grus* have been determined from sundry tertiary deposits of Europe and North America.

I doubt if any of the cranes are fishers, or at least habitually so, though once in a way they may happen to pick up a small fish; as more commonly they will seize any small quadruped or reptile that comes in their way. I have seen a tame Common Crane (*G. communis*) pick up a quail, which it would doubtless have gulped down if undisturbed; but on being pursued it dropped its prey uninjured. For the most part, they are mainly vegetable-feeders, and will thrive upon grain only, to the crops of which some of the species are exceedingly destructive, while others are much less so. They feed chiefly in the early morning, and rest during the day in open places—as sandbanks in rivers, or in extensive sheets of shallow water (“jheels,” as they are termed in India)—where their vision can command an exceedingly wide range around, returning to the fields for another feed towards evening. In common with many other gregarious birds as well as quadrupeds, they have always sentinels on the look-out while the rest of the flock trustfully repose; and they likewise have them on the watch in their marauding expeditions to the crops of grain or pulse. Old Æsop’s fable of the stork being captured in the evil companionship of the cranes, and being condemned to death for thus associating with notorious grain-plunderers, indicates that he knew well enough the two kinds of bird—far better indeed, as I have remarked on a former occasion, than did the renowned prince of mediæval painters, who commits the zoological mistake of introducing cranes instead of storks into his world-famous cartoon of the miraculous draught of fishes. In the grass-paddocks in which cranes are usually confined in *vivaria*, they have more or less the habit of tearing up the grass in quest of earthworms, and so rendering their allotted place of abode unsightly. Mr. Howard Saunders remarks that in Spain the Common Crane is “partial to acorns, and in the Dehesa de Remonte it interfered so much with the fattening of the pigs which are driven in to feed, that war was declared against the species by the proprietor”: (*Ibis*, 1871, p. 389.)

From various observations made upon different species of this family, it appears that they pair for life, and that some at least of them do not breed until their second year, as the Sárás (*G. antigone*) and the Asiatic White Crane (*G. leucogeranos*); but it is certain that the American White Crane (*G. americana*) propagates while still in the plumage of immaturity. Mr. Hume has especially shown that the Asiatic White Crane does not breed

until its second year; also that in this species the same birds return annually to their previous winter quarters, the adults in pairs, accompanied by a single offspring, while the birds of the preceding year associate together in small societies. They also return annually to the same breeding haunts, and repair their old nests as required, which was personally witnessed by Mr. E. L. Layard in the instance of the Wattled Crane of South Africa. The nest varies according to circumstances, but I suspect that most cranes prefer to commence it in shallow water, accumulating a mass of material to a height of several inches above the surface. Mr. T. Ayres found a nest of the Wattled Crane (*G. carunculata*) "in a very large lagoon, near the Vaal river. The nest was about five feet in diameter, and of a conical form; it was composed of rushes pulled up by the birds, and was placed in water about five feet deep, the eggs being well out of the water:" (*Ibis*, 1868, p. 468.) The Sárás Crane (*G. antigone*) nests in like manner, and I have known a pair of tame Sárás to build in a small inundated patch of rice ground, within the walled garden of a Hindoo Raja near Calcutta, where secure from the rapacity of jackals. Mr. J. Wolley, jun., has elaborately described the nesting of the Common Crane (*G. communis*) in Lapland, in the *Ibis* for 1859. But Mr. Gould states that the Australian species (*G. australasiana*) breeds "on the ground, usually depositing its eggs in a slight depression of the bare plains; though occasionally," he adds, "the low swampy lands in the vicinity of the coast are resorted to for that purpose." There is an excellent account of the breeding of the Demoiselle Crane (*G. virgo*) in the Dobrudscha by Mr. A. S. Cullen, in the *Field* for Sept. 11, 1869, where it is remarked that "the nest is, without exception, made on the ground, usually amidst some kind of young grain, but often amongst grass on fallow land, and now and then, though more rarely, amongst stubble. The nest, if indeed such it can be called, is made by the birds pulling up or tearing down the grain, grass, or stubble for the space of about two feet, and scratching the smallest possible hollow in the middle of the bare patch thus formed." A Demoiselle Crane has incubated upon such a nest in a grass paddock in the Zoological Gardens, Regent's Park, where other species have bred in like manner. Lastly, it may be mentioned that Mr. Ayres met with a single nest of the Southern Crowned Crane (*Balearica regulorum*), which was "of a conical form, built in a swamp, and placed in about the same depth of water as the nests of the Crested Coot (*Fulica cristata*), which it also resembled in the rushes that had been chosen as the materials for its construction." Mr. Ayres adds that he thinks the nest was begun in shallower water, and added to as the season advanced and the water increased in depth (*Ibis*, 1868, p. 256). No doubt this must have been the case with the nest of the Wattled Crane described by the same observer as being situate in 5ft. depth of water.

As a rule, two eggs are produced; but Mr. Hume remarks of the

Asiatic White Crane (as observed by him in its winter quarters) that "they never appear to have more than one young one with them; but it does not at all follow," he adds, "that they do not lay more than one egg. Our commonest Indian crane (*G. antigone*), which usually lays two, and sometimes, though rarely, three eggs, and which has no long or arduous journey to perform, seldom succeeds in rearing more than a single young one." He further adds that, of more than a hundred pairs of *G. leucogeranos*, which he had observed (from first to last), while in their winter quarters, he had not seen any accompanied by more than a single offspring. Mr. Meves informed Mr. Dresser that he had known instances of three eggs of *G. communis* being found in the same nest. In the "Contributions to Ornithology," edited by Sir W. Jardine, Bart., two eggs of the Sárás Crane are figured, of a very pale blue or bluish-white, scantily speckled over with small spots and groups of spots of a reddish-brown colour. Those of the Australian species (or "native companion," as it is usually styled) are described by Mr. Gould as being "of a cream colour, blotched all over, particularly at the large end, with chesnut and purplish brown, the latter colour appearing as if below the surface of the shell." The egg of the Common Crane (*G. communis*) is figured in Hewitson's "Eggs of British Birds" of a pale olive-brown, with dull red spots and blotches; and the nesting of this species is illustrated in the "Ootheca Wolleyana" (tab. E.), edited by Professor Newton. In the "Fauna Boreali-Americana" we find the eggs of the American White Crane (*G. americana*) described as being like those of the Sárás. The egg of the true Sandhill Crane (*G. Canadensis*) is described to be of a dirty white, or rather light-brown colour, with reddish-brown spots, quite irregular in figure, and thinly scattered over the surface:" ("United States Exploring Expedition," p. 295.)

The eggs of the Demoiselle (*G. virgo*) "are very similar to though smaller and more elongated than those of the Common Crane"; and Mr. Layard describes those of *G. carunculata* as closely resembling in colouring the eggs of *G. virgo* and of *G. paradisea*; but in the crowned cranes (*Balearica*) it would seem that the eggs are not invariably spotted. That of the southern species (*B. regulorum*), as exemplified by a specimen sent him by Mr. Ayres, is described by Canon Tristram as "white, with a green lining membrane, its texture glossy, and its size about that of the egg of a goose:" (*Ibis*, 1868, p. 256.) Dr. Bree, however, figures that of *B. pavonina* (after Thienemann) as being of a light brown with a few dark specks.

The young are soon upon their legs (*præcoces*), but are fed by their parents until they acquire strength, and indeed for a long time afterwards. In the "Proceedings of the Zoological Society" for 1861 (p. 369), there is an elaborate account of a young Manchurian Crane (*G. viridirostris*) by

Mr. Bartlett, which was bred in the Zoological Gardens, Regent's Park, but he does not describe the egg.

Near the middle of May a pair of these birds formed a rude nest of dry rushes on the ground, and soon afterwards two eggs were laid. The parent birds took turns upon these eggs during the time of incubation. On the 24th of June a young crane was hatched, the period of incubation having been thirty days. The young bird was well covered with down of a light brown or fawn colour, with darker markings on the back; it was short on its legs, and the bill also appeared short; in fact, it appeared less like a crane than I expected to see it. It was able to walk about as soon as it was hatched, but appeared feeble, and now and then fell, or rolled over, in its attempts to follow its parents. The old birds attended to the young one with much care, and furiously attacked everything that came near the place; they collected worms, beetles, &c., from all parts of their inclosure, which they brought in their bills towards the young birds, and after mutilating all living food they would hold it near the young bird, who would advance and pick it from their bills, or from the ground as soon as it was dropped by them. The young crane never opens its mouth and cries for food like the storks and herons and many other young birds, but utters a rather loud note. like peep, peep, peep, not unlike the chick of a common fowl: it is not, however, as adroit and able to obtain its food as the young of the gallinaceous birds generally are, and consequently the parent birds are far more attentive, and watch every opportunity of obtaining food and preparing it for the young one. I have frequently seen the old birds offer a piece of biscuit (that the young bird found was too large to swallow), and they then would place it on the ground, and by repeated blows break it up in small pieces, and then drop these close to the young bird, who would pick them up and swallow them. . . . Perhaps the most remarkable thing is the rapid growth of the young crane, which is very surprising. As I have before stated, at first the legs are short—in fact, as compared with the parents, the bird is remarkably small, and few persons would guess what it possibly could be; in a few days, however, the legs begin to grow rapidly, and the neck and bill become elongated, the bird quickly appearing like a crane in shape.

This excellent account recalls most vividly to mind what I remember to have seen of the rearing of young Sárás cranes in India, and how savage were the parent birds until the young had attained considerable growth. In the Sárás chick it is remarkable that, while the general colouring is slightly brownish grey, that portion of the neck which is bare and crimson in the adult is in the young conspicuously indicated by a ferruginous colouring of the down or downy feathers with which it is then clad. As the bird grows older the same is still observable, and it is likewise noticeable in other species of the genus, as the Asiatic White Crane, concerning which it has been specially remarked by Mr. Hume. That close and accurate observer states of *G. leucogeranos*, when in its winter quarters, that the "watchful care and tender solicitude evinced by the old birds for their only young is most noticeable. They never suffer it to stray from their side, and, while they themselves are rarely more than thirty yards apart, and generally much closer, the young, I think, is invariably somewhere between them. If either bird find a particularly promising rush tuft, it will call the little one to its side by a faint creaking cry, and watch its eating, every now and

then affectionately running its long bill through the young one's feathers." The young Mantchurian crane described by Mr. Bartlett is admirably figured by Wolf in the volume of the *Proceedings of the Zoological Society* for 1861 (pl. xxxv). Mr. Dresser, in his "History of the Birds of Europe," figures the chick of *G. communis*, the downy vesture of which is ferruginous. Respecting the Mantchurian species Mr. Bartlett continues:

From the time of hatching the female alone broods upon or nestles the chick, although the male takes turn in the task of incubation; and I notice that the female does not squat down on the young one to brood, but sits down on the ground near it, and the young bird immediately walks behind her: she then raises her long black plumes, between which the little one creeps, and passes forward under one of her wings until quite out of sight; her plumes are then lowered into their ordinary position. There is a beautiful example of the progressive growth from the first down to the perfect feathers to be seen in the young of this bird. I have in many birds observed this, but not to so great an extent. It appears that the first down is not thrown off, but continues to grow longer, until the perfect feather is developed, having the early down attached at its point; this condition is to be seen not only on the points of the primaries, but also on the ends of the feathers of the entire plumage. The rapid growth of the plumage can be best understood from the fact that on the 27th of September it was found necessary to catch the young bird (hatched on the 24th of June), in order to cut the primaries of one of its wings to prevent its flying away. The bird by this time almost equalled its parents in size, and now is attaining the colouring of the adult.

In most, if not all, bare-fronted or bare-necked birds the young are not so, as familiarly exemplified by the turkey and the guinea-fowl. Mr. Hume has particularly noticed how the Asiatic White Crane becomes bare in front. "Long before they leave," he writes, "the rich buff or sandy colour of the young has begun to give place to the white of the adult plumage, and the faces and foreheads, which (as in the Common Crane) are feathered in the young, have begun to grow bare. This, I notice, seems to result from the barbs composing the vanes of the tiny feathers falling off, and leaving only the naked hair-like shafts:" (*Ibis*, 1868, p. 33.) He also remarks that the young of the second year, which associate together in small flocks when in their winter quarters (apart from the older and paired birds, each with their single offspring), have not at that age attained to their full size and weight.

The common European Crane is one of the most highly gregarious of the group, at least in its migratory flights and whilst in its winter quarters. Col. Chesney writes of it, but, strangely, without recognising the species, and after noticing the Ostrich as being still an inhabitant of Syria and part of Arabia, states that—

Another large bird occasionally appeared, passing southward in such great flocks as to cover the swelling hills of North-western Arabia with their tall erect figures. Seen on the hills at a distance, they looked like a force clad in pale grey, with sentinels and outposts carefully placed on the flanks to give notice of the approach of an enemy from any quarter. All our efforts failed in approaching this wary bird, even within rifle

distance. It appeared to stretch its head upwards like the ostrich to a height of more than four feet, and was uniformly of a pale grey colour like the heron. The name given it by the Arabs was *rukháma*: (Journal Euphrates Expedition, i., p. 588).

In some "Remarks on the Habits, &c., of Birds met with in Western Texas," by Col. G. A. McCall, Inspector-General U.S. Army, that officer states of the Sandhill Crane, or "Brown Crane" (as he designates it), that: "This crane I found in the Rio Grande from Santa Fé to El Paso, in October; but more particularly between Albuquerque and Sorocco, where, for fifty miles, the land appeared to be covered with them. They filled the corn fields" (*i.e.*, those of maize) "and alighted close to the houses, never being disturbed by the gun:" (Pro. Acad. Nat. Sci. Philadelphia, 1851, p. 223.) Elsewhere, however, that species is just as wary as any of its congeners.

An established roosting place of the Common Crane during the winter months in Palestine is thus graphically described by Canon Tristram:

It was the only species of crane we observed, and that only in winter. At Noladah, about thirty miles west of the south end of the Dead Sea, we chanced to camp close to a roosting place of cranes. Hard work, and I hope a good conscience, made us sound sleepers, else the din of the cranes might have aroused an Ephesian. Towards sunset these large birds began to return homewards, flying in order, like geese, with outstretched necks, keeping up a ceaseless trumpeting; but, unlike rooks, they were not all early to bed, for fresh arrivals seemed to pour in for several hours, and the trumpeting continued till morning, with only an occasional lull. The howl of some wandering jackal would rouse the whole camp; then, after a slight pause, the wail of a hyena evoked a deafening chorus; and before daylight began an angry discussion, perhaps on the next day's foraging. Parties of some hundreds departed for the south with the dawn; others remained, possibly to make up for their broken slumbers, till the sun had risen a couple of hours. The roosting place was a group of hillocks, covering several acres, and was covered with the mutings of the birds as thickly as the resort of any sea-fowl. It had evidently been occupied for years. I have no reason to think that this crane ever breeds in Palestine. We did not meet with the demoiselle (*G. virgo*), though it ought to occur, being common both east and west: (*Ibis*, 1868, p. 324).

Such a scene as was witnessed by Canon Tristram in the instance of the ordinary European species is admirably represented by Joseph Wolf in his illustration of the superb Manchurian Crane, published in one of his well-known series of "Zoological Sketches," the original of which, with the rest of the series, is exhibited in the picture-room near the Reptile House in the Zoological Gardens.

There are few birds more readily tameable than the cranes, even when captured in mature plumage. They soon learn to become fearless and familiar, the larger species indeed too much so, as also too aggressive not unfrequently. But they are not generally vicious, except when they have young, and are highly ornamental wherever they have room to display themselves. Mr. Gould gives the following interesting anecdote of the Australian species:

Mr. James M'Arthur informed me that a pair which he had kept in the immediate neighbourhood of his house, and which had become perfectly domesticated [*i.e.*, tame], so far attracted the notice of a pair of wild birds as to induce them to settle and feed near the house, and, becoming still tamer, to approach the yard, take food from his hand, and even to follow the domesticated (P) birds into the kitchen, until unfortunately, a servant imprudently seizing at one of the wild birds, and tearing a handful of feathers from its back, the wildness of its disposition was roused, and, darting forth, followed by its companion, it mounted in the air, soaring higher and higher at every circle, at the same time uttering its hoarse call, which was responded to by the tame birds below. For several days did they return and perform the same evolutions without alighting, until, the dormant impulses of the tame birds being aroused, they also winged their way to some far distant part of the country, and never returned to the home where they had been so long fostered.

Where these birds are unmolested and protected, as is the Sárás Crane in parts of India, the Common Crane among the Buddhist Kalmuks of Astrakhan, and (if I understand aright) the White-naped Crane in Japan, they scarcely exhibit any wildness or fear of man; but when persecuted by gunners, or by the setting of nets or other snares for them, they soon become unsurpassably wary and suspicious (as Chesney found the common species to be in Arabia), which argues somewhat favourably for their intelligence. I have seen numbers of netted cranes (*G. communis*), two or three dozen of them at a time, together with netted wild geese (*Anser cinereus* and *A. indicus*), brought alive for sale to the Calcutta provision bazaar, where I am not aware that the former are ever bought for the table.

No slight difference of opinion has been expressed regarding the quality of the flesh of the crane family as a gastronomical delicacy; but when in fit condition for cooking certain species of them are pretty well unsurpassable. Mr. Hume has very sensibly explained the matter. He remarks that

In Europe nowadays the common crane is not thought worth eating, and people wonder at our ancestors esteeming them as they did; but the reason of this is obvious. In former days, when they were so numerous in Norfolk and other counties, they used, I apprehend, to arrive [from the fens] at the time of wheat harvest, and feed exclusively on grain. Grain-fed cranes are delicious. The common cranes that have lately left us [in India], and which for two months had been daily gorging themselves in our fields on grain of various kinds, were fat, juicy, tender, and delicately-flavoured—in fact, to my mind, with the exception of a florican (*Otis deliciosa*), or one of our Norfolk pheasants, about as good birds as can be placed on table; and this, although five or six months before, when they first arrived, they were stringy, tough, lean things, not worth eating, or shooting even except for plumes: (*Ibis*, 1868, p. 37.)

Mr. Ayres writes of the paradise or Stanley crane of South Africa that “these birds feed on seeds and roots” (bulbs?) “as well as on insects, and their flesh is not at all bad-eating; slices from the breast, fried with butter, are scarcely to be distinguished in taste from excellent beef.” (!) In India the white stork (*Ciconia alba*), the white-necked stork (*C. leucocephala*), and sometimes the oriental white ibis (*Ibis melanocephala*) are occasionally styled

"beefsteak birds," from a fancied resemblance of the breast-cut, when cooked as a beefsteak, to that coveted article of diet in the depths of the "mofussil."

It will doubtless have been remarked that Mr. Hume suggests that the cranes upon which our ancestors feasted arrived in this country about the time of wheat-harvest; whereas there is amply sufficient evidence of their having bred regularly in the fenny counties of England. (*Vide* Yarrell's "History of British Birds," and Stevenson's "Birds of Norfolk," vol. ii., pp. 125, *et seqq.*) Sir Thomas Brown (*circa* 1667), however, asserts that "cranes are often seen here *in hard winters*, especially about the champion and fenny parts." There must surely be some mistake about these birds appearing in England as winter visitants! Within less than a century ago, as I learn from Mr. Cordeaux's work on the "Birds of the Humber District" (p. 100), by the Fen laws, passed at the "court view of free pledges and court-leet of the East, West, and North Fens, with their members, held at Revesby, 19th October, 1780," it was decreed that "no person shall bring up or take any swan's eggs, or crane's eggs, or young birds of that kind, on pain of forfeiting for every offence 3s. 4d." This edict, remarks Mr. Cordeaux, looks very much like shutting the stable door after the horse was stolen. "It appears somewhat singular," he adds, "after the evidence of Willughby, and the antiquarian Gough, that cranes should have nested in the fens so late as the end of the eighteenth century, just previous to the drainage and inclosure of the West Fen!" On this subject I refer the reader to the work of Mr. Cordeaux.

I recognise only two genera of *Gruidæ*, *Balearica* and *Grus*, which appear to me to be sufficiently distinguished from each other. *Balearica* is African, with two species respectively inhabiting west and south (considered by Buffon and others to be male and female of the same species), and which are popularly known as the crowned cranes, in reference to their very extraordinary sort of crest. Of the restricted genus *Grus* four species have the tertiary plumes elongated and drooping, and two of these are peculiar to Africa; another being common to Africa and Asia, besides visiting and breeding in parts of the south-east of Europe; while the fourth species so characterised is the white-naped crane (*G. leucauchen*) of Japan, in which the tertiaries are considerably more elongated than in any that follow (as shown in the engraving of this species), while its style of coloration approximates that of the Wattled Crane (*G. carunculata*) of South Africa; both of these latter species being akin to the Sárás group, and in fact belonging to it; as does likewise the Asiatic White Crane, all of which Sárás group have the tertiaries incapable of being raised at will, or at most to a very slight extent. The rest, consisting of at least six species, are of the same sub-type as the common European Crane, and, like it, have the tertiaries very broad, with open and discomposed

vaned to a greater or less extent, and capable of being raised at will to form a striking and beautiful adornment. With two exceptions only (among the species with long and drooping tertiaries), all of the species of restricted *Grus* have, when adult, the head more or less bare, and wholly or in part red and papillose, brightening into crimson at the breeding season.

With regard to the affinities of the cranes with other forms of *Grallæ*, I entirely assent to the opinion of Mr. W. K. Parker (as quoted by Jerdon), that "the crane is a gigantic specialised representative of the Perissirostral family," i.e. of the *Limicolæ*, or great plover and snipe series, and that they are very far indeed removed from the storks and herons, which Professor Huxley has well shown to be considerably more akin to the *Totipalmati*. Their eggs bear a notable resemblance to those of the bustards, which constitute another distinct specialised group, branching out from the *Limicolæ*. In no crane do we observe any seasonal change of hue in the plumage, as is so strongly marked a characteristic of many of the ordinary *Limicolæ*; but in some bustards the males only undergo a marked seasonal change, as exemplified by *Tetrax campestris*, and by *Syphiotides bengalensis* and *S. aurita*; *Otis tarda* also putting forth its seasonal whisker-tufts on the male sex only. In one of the small and more ordinary *Limicolæ*, the *Phalaropus fulicarius*, the female sex only undergoes a seasonal change of colour in the plumage, and in the genus *Rhynchea* the female is a larger and much more richly coloured bird than its mate (as we likewise find in some at least of the *Turnicidæ*); but these are exceptional cases, like the wondrous seasonal adornments of the polygamous Ruff (*Machetes pugnax*), and the development of the frontal caruncle simultaneously with change of hue in the plumage of the (presumably) polygamous male Korá (*Gallinago cristatus*), the males in both of these instances being a third larger than the females, whereas in the mass of ordinary *Limicolæ* the females are larger than the males, as is so remarkably exemplified by *Limosa lapponica* and *Numenius arcuatus*, and again by some of the *Turnices* (which last, however, are not *Limicolæ*). In the *Gruidæ* the male sex is invariably the larger; and again so in the ibises and spoonbills, from which latter genus *Tantalus* must be removed and transferred to the *Ciconiidae* (or storks), and I rather doubt whether the so-called Glossy Ibis should be regarded as a veritable Ibis, rather than as appertaining to the same family as the curlews, godwits, and kindred forms. In certain of the spoonbills (which unquestionably belong to the family of *Ibididae*), there is more or less of seasonal adornment, while in the Glossy Ibis, the seasonal change of colour is as great as in any of the *Limicolæ*, the head, neck, and under parts of both sexes becoming wholly of a rich dark ferruginous, as paralleled by no other form of Ibis. The *Ibididae* also lay spotted eggs, and (to my apprehension at least) are as far removed from the *Ciconiidae* and *Ardeidae* as are the cranes; but do they approximate the latter? Certainly, to some extent, though by no means

closely. Neither do I perceive any very decided near kinship to the *Gruidæ* on the part either of *Dicholophus* or *Psophia*, both of which genera have been currently regarded as being considerably akin to the cranes. As a group the *Gruidæ* stand very much alone, and the more I have studied them the more strongly impressed have I become with this opinion. The resemblance of most of the cranes to the trumpeter group of swans consists not only in the fact of the trachea undergoing a convolution within the keel of the breast-bone, but also in the rusty edgings of the feathers of the young birds, as likewise observed in very many of the ordinary Anatidæ.

[In relation to the affinities of the *Gruidæ*, Professor Newton remarks :—(Encycl. Brit., art. Crane.)

Though by many systematists placed near or even among the Herons, there is no doubt that the cranes have only a superficial resemblance and no real affinity to the *Ardeidæ*. In fact the *Gruidæ* form a somewhat isolated group. Professor Huxley has included them together with the *Rallidæ* in his *Geranomorphæ*; but a more extended view of their various characters would probably assign them rather as relatives of the Bustards—not that it must be thought that the two families have not been for a very long time distinct. *Grus*, indeed is a very ancient form, its remains appearing in the Miocene of France and Greece, as well as in the Pliocene and Post-pliocene of North America. In France, too, during the “Reindeer Period” there existed a huge species—the *G. primigenia* of M. Alphonse Milne-Edwards—which has doubtless been long extinct.”]



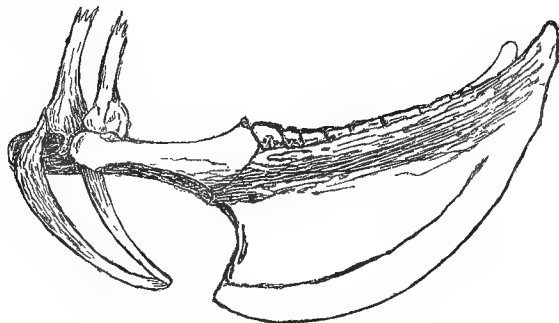
THE SACRED CRANE OF JAPAN.

I.—BALEARICA.

IN the crowned cranes (*Balearica* of Brisson) the bill is much shorter than in the others, and the nostrils are ovate instead of being elongated. The feathers composing their clothing plumage (*i.e.* those of the neck and body) are long and hackle-shaped, being often raised or ruffled, which produces an exceedingly fine transient effect. The occiput is adorned with a large and highly remarkable crest or "crown" of wire-like bristles (or, more properly, unwebbed shafts of feathers), which radiate from an elongated centre, each one being about three inches and a half long, flat, and twisted through its entire length, one side of it being white and the other pale brown, so as to appear ringed with these colours, and having the extreme tip black. The frontal and coronal feathers anterior to the crest are smooth, prominent, and velvety black. The skin before the eyes is nude and black, being continuous with a great naked cheek-patch, which is white, with more or less of red (and the latter differently disposed), according to the species, and again with a naked throat-wattle, which is in like manner more or less developed. The wings are white, with black primaries and secondaries, and dark brownish-red tertiaries, the last rather broad, and above them are some elongated and discomposed pale golden fulvous plumes, which fade much in hue before they are shed at the annual moult. When the wings are spread, as when "dancing," their inner surface is seen to be white with contrasting black flight-feathers. The irides are conspicuously light blue; bill and legs black. The young are dusky, with brown margins to the feathers of their dorsal plumage; the head being clad with downy plumelets, which are very short upon the cheeks, and the occipital tuft being well developed (at least when the bird is about one-fourth grown), and consisting of erect downy feathers about 1½ in. long, which, together with the medial line of the crown, are of a pale brown colour; the upper portion of the neck also is light brown (at least in *B. regulorum*), and the wings are white, margined with pale fulvous.

In this well-marked genus of cranes the trachea is of the usual form, proceeding straight to the divarication of the bronchi; and its long tendinous pair of lateral muscles are remarkable for being attached at

their lower extremity to the first pair of true ribs. This I have observed in three or four specimens of *B. pavonina*, and am unaware of any other bird in which these muscles are similarly attached. They perch more freely than do other cranes; both species are African, one of them occasionally straying into Europe. Buffon supposed the two species to be male and female of the same; but they inhabit different parts of Africa, and paired couples of each of them may be commonly seen in *vivaria*, the male being conspicuously larger than his mate. Both species were figured by Edwards in 1751, pl. 192. They are well-distinguished though closely akin to each other.



STERNUM OF *BALEARICA CHRYSOPELARGUS*.

BALEARICA CHRYSOPELARGUS (LIGHT.).

THE KAFFIR CRANE.

ARDEA CHRYSOPELARGUS, Licht. Cat. rer. nat. rar. (1793.)

ANTHROPOIDES REGULORUM, Bennett, P.Z.S., 1833, p. 118.

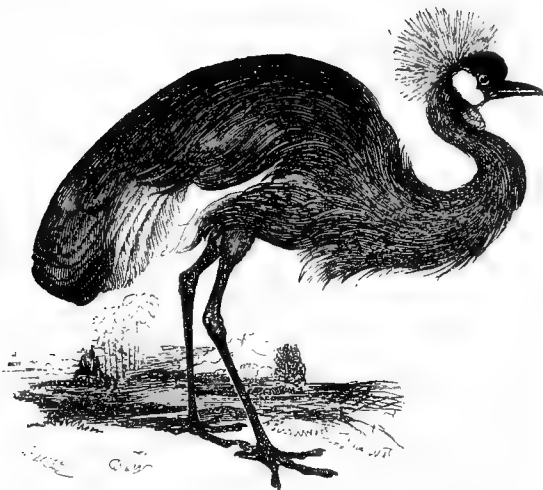
L'OISEAU ROYAL, Buff. Pl. Enl. pl. 265. (1783.)

THE KAFFIR OR CROWNED CRANE of the colonists.

[The following communication on the name of this species was read before the Zoological Society, February 17th, 1880 :

The Kaffir Crane is usually termed *Balearica regulorum* (Licht.), apparently on the authority of Mr. E. T. Bennett, Vice-Secretary of this Society, who, at the meeting held on November 12, 1833, "exhibited specimens of Crowned Cranes from Northern and from Southern Africa, with the view of illustrating the characters which distinguish as species the birds from these several localities. Their specific distinction, he stated, on the authority of Professor Lichtenstein, had been pointed out, nearly thirty years since, by the Professor's father, who gave to the Cape bird the name of *Grus regulorum*; this distinction has, however, not been generally known among ornithologists, although to those connected with the Society it has for some time been familiar, from observation both of numerous skins and of living individuals. In the bird of North Africa, for which the specific name of *pavoninus* will be retained, the wattle is small, and there is much red occupying the lower two thirds of the naked cheeks; in that of South Africa the wattle is large, and the cheeks are white, except in a small space at their upper part; the neck also is of a much paler slate-colour than that of the North-African species:" (Proc. Zool. Soc. 1833, p. 118.)

In this communication Mr. Bennett adopted the generic name *Anthropoides*, Vieill., Mr. Gray advocating the retention of the name *Balearica*; but in the "Gardens and Menagerie of the Zoological Society," 1835, Mr. Bennett described one species only, which he called *Balearica pavonica* (Vig.); and for this he gave the following figure of the Southern species!



Neither does the name appear to have been employed by the elder Lichtenstein; for the "Cat. Dupt. Berl. Mus. 1793," quoted by Layard in his "Birds of South Africa," appears to be a combination of the Latinized title of "Verzeichniss der Doubletten des zoologischen Museums der königl. Universität zu Berlin, von Dr. H. Lichtenstein," Berlin, 1823, in which the species is not named, with the date of the following—"Catalogus rerum naturalium rarissimarum, Hamburgi, d. xxi. October, 1793, auctionis lege distrahendarum," with preface by M. Ant. Aug. Hen. Lichtenstein, Rector der Johannis-Schule, Berlin. A copy of the latter catalogue exists in the Banksian Library; and in it the Western Crowned Crane is included under the generic name of *Ardea*, and the Kaffir Crane is described as follows:—

"284 A.!! *Ardea chrysopelargus, nobis. Ardea oculorum area nuda; corpore supra item collo et pectore ex fusco æneo; subtus albo. Rostrum fere 10 pollices longum rubrum basi exalbidum. Nares lineares ultra 4 pollices longæ, mandibulem superiorem in medio quasi sulco pervio dirimunt. Genæ et collum purpureo nitore fulgent, reliquum corpus, quatenus ex æneo fuscum est viridi splendore renidet. Remiges nigre; rectrices supra sunt æneæ, infra ut venter et crissum albescent. Pedes 29 pollices longi, pallide rubri. Digiti antici basi palmati, posticus brevis terram tamen attingens. Longitudo universa 4 pedum $6\frac{1}{2}$ pollicum. Habitat in terra Cafrorum.*"

Consequently it appears that, if the rules of the usually accepted code of nomenclature are to be carried out, the name of this species must be changed from *B. regulorum* to *Balearica chrysopelargus* (Licht.)—the meaningless name *regulorum* being apparently, as suggested by Mr. Sclater, a corruption of the term *oculorum* in A. A. H. Lichtenstein's description. (W. B. Tegetmeier in Proc. Zool. Soc., 1880, p. 93.)]

This is the larger and more handsome of the two species, and it has a most conspicuously-developed throat-wattle in both sexes, whereas in the other the same caruncle exists, but is so small as to pass unnoticed in the living bird. The clothing plumage is also differently coloured. In *B. chrysopelargus* the predominant hue is grey, pale on the neck, and

darkest on the scapularies; and the very nude cheek patch is white, narrowly bordered with crimson towards the crest. In the male the crimson is barely indicated, but it is well shown in the females, and in the latter, the white is sometimes also irregularly blotched with red. The pendulous throat-lappet hangs down fully three inches in the male, being not much shorter in the female, and is red, becoming bright crimson when the bird is in breeding condition, its basal fourth being black and continuously so with a ring encircling the cheek-patch. The length of this bird is about $3\frac{3}{4}$ ft.; closed wing, $1\frac{3}{4}$ ft.; and tail 1 ft.; spread of wings more than 6 ft. (Chapman).

This very handsome crowned crane inhabits the South of Africa, and for the feathered denizens of that part of the world our chief authority is Mr. E. L. Layard's "*Birds of South Africa*," supplemented by the notes of Mr. T. Ayres contributed to the *Ibis* through Mr. J. H. Gurney, and by those of the late Mr. C. J. Andersson, which have been published in a collected form by Mr. Gurney, as "*Notes on the Birds of Damaraland*."

Mr. Layard remarks that in the Cape Colony this species "is more common in the eastern frontier than about the western extremity, perhaps owing to the latter being more settled and cultivated, as it is found in considerable numbers to the north and north-west. It has never fallen under my notice in its wild state." Mr. Andersson states that he had never observed it in Great Namaqua or Damara Land; "but I have met with it," he adds, "at Lake Ngámi, and also on the rivers Botletlé, Teoughé, Okavango. In Ondonga it is very common during the dry season, but leaves the open plain when the wet season returns. It is met with singly or in pairs, and sometimes in small flocks, and presents a very graceful appearance as it stalks leisurely about in search of its food, which consists of various insects, of the smaller reptiles, and, it is said, of fish also. The yellow bristles of this crane are used by the inhabitants of Ovampo Land as ornaments for their heads." Mr. Ayres, in his "*Notes on the Birds of the Territory of the Trans-Vaal Republic*," remarks that "these handsome cranes are generally, though sparsely, distributed over the country, and have much the same habits as the Stanley" (or paradise) "cranes, with which they occasionally associate, as flocks of each may be seen feeding together on the banks of the Vaal river below Bloemhoff." (*Ibis*, 1871, p. 264.) No one of the three South African species of crane has been met with north of the equator, and how far towards the equinoctial region the geographical range of each extends we seem to have yet to learn. Dr. Kirk, however, informs us that the present species is "found on the Zambesi and Shirè at all seasons; also on Lake Nyassa. It is seen in flocks in the interior; but near the coast more commonly in small numbers." (*Ibis*, 1864, p. 331.)

By Mr. Layard we are told that "a magnificent egg of this species, in the South African Museum [Cape Town] is of a dull pale brown tinged with

green, and obscurely marked, chiefly at the obtuse end, with faint reddish-brown confused blotches and spots, with here and there a dark mark standing out prominently; axis, $3\frac{1}{2}$ in.; diameter, 2 in. 5 lines. The egg of the other species of crowned crane figured by Dr. Bree in his 'Birds of Europe' gives a very fair idea of the egg sent to me by Mr. Arnot; only the spots are more concentrated and fuller, and the ground colour is greener."

In the *Ibis* for 1873, p. 286, there is an "Additional List of, and Notes on, Birds obtained in the Republic of Trans-Vaal," by Thomas Ayres, communicated by Mr. J. H. Gurney. Of the Southern Crowned Crane (*Balearica regulorum*) he remarks, "I have been fortunate enough to get two more eggs of this crane; they are precisely similar to those mentioned in the *Ibis* for 1868, p. 256, except that those now obtained were quite fresh, whereas the previous ones were much incubated, and in consequence had a dirty, glossy, and worn appearance. One of these eggs measured $3\frac{7}{16}$ in. by $2\frac{3}{16}$ in., the other $3\frac{9}{16}$ in. by $2\frac{4}{16}$ in. They were taken from the nest on December 22nd, 1871, by my friend, Mr. J. C. Bodenstein, on whose statements I can implicitly rely, and who also shot one of the old birds, the skin of which I now have. The nest was found in an extensive swamp on the banks of the Movi river, about twenty miles from Potchefstroom, and was composed of rushes pulled and placed in a conical form on the rank long grass, which falls over from its own weight, and forms a thick carpet of vegetation, often more than a foot thick; the nest was built where the water was about ankle-deep, and contained two eggs only."

[Mr. T. C. Buckley, in his notes on the birds of the Matabili country (*Ibis*, 1874, p. 389) states that *B. regulorum* is pretty common throughout the open country of the Trans-Vaal, and is called by the Dutch "Mähem." He found a large floating nest composed of dried reeds, in which were two white eggs, tinged slightly with blue. The nest had no lining whatever.

Mr. F. A. Barratt, in the "Notes on the Birds of the Lydenburg District" (*Ibis*, 1876, p. 209), writes :

In the district of Potchefstroom this bird is not at all uncommon. I have seen them between Bloemfontein, Potchefstroom, and Pretoria.

In the winter they may be seen half a dozen together; but in the time of nidification they are only found in pairs. I have never found two pairs breeding together in the same vley, but always some distance apart; and they can be heard a long way off, calling out "mahem" with a delightful mellow note. At the present time I have four living which I brought over from the Orange Free State and Trans-Vaal. They all, with the exception of the young one, have the white cheek. I have seen birds from the western coast with it red; but I have never seen them so from the Trans-Vaal. All I have shot, heard of, or seen have had the cheek white. The eggs I have always found to be white, with a bluish cast. Some state, however, that they are spotted; but I have never found them so. I have seen these birds a few miles north of Pretoria.

The immature plumage of this species had not been carefully noted until

Mr. T. Ayres has obtained a young bird, now preserved in the British Museum, which is thus described by Mr. J. H. Gurney (*Ibis*, 1877, p. 348):

This specimen, which was nearly full-grown, had the irides light ash-colour; the bill black, but with the base of the lower mandible pale; the bare skin between the bill and the eye black, the adjacent space, which is occupied by the wattles in the adult, thickly clothed with short yellowish white down; and the legs and feet ashy black. Its plumage differs from that of the adult bird in the following particulars:—The front part of the head, instead of being black, as in the adult, is a rich fulvous, with a very few small black spots intermixed; the crest, which is about half-grown, the back of the head, and the upper part of the neck and throat are of a similar hue; but the colour, especially on the neck and throat, is paler than on the forehead, and is varied on the sides of the neck by the dark bases of the feathers being apparent; the mantle is slaty black, with narrow tips to the feathers, some of these tips being rufous, others (especially those nearest the wings) being pale brown; the wing-coverts are white, but with most of the feathers variegated by a subterminal slate-coloured mark and a much narrower rufous brown tip; and with the further exception of the coverts of the tertials, in which each feather is wholly banded with alternate transverse bars of slate-colour and rufous; on the bastard wing the feathers are more slate-coloured than in the adult, but have not also, as in the adult, a tinge of rufous; the lower back is of a dark slate-colour intermingled with white, and with rufous tips to those feathers which lie nearest to the thighs and upper tail-coverts, the latter of which are black, tipped with fulvous; the under tail-coverts are composed of long downy feathers of a pale buff colour, transversely barred with dull black, the abdomen and thighs are pale buff, slightly mingled with black; the breast and flanks are slaty black, with narrow pale buff edges.]

BALEARICA PAVONINA (LINN.).

THE WEST AFRICAN CROWNED CRANE.

ARDEA PAVONINA (Linn.), Syst. Nat., vol. i., p. 233. (1766.)

BALEARICA (Briss), Ornith., vol. v., p. 511, pl. 41. (1760.)

ANTHROPOIDES PAVONINUS (Bennett), P. Z. S. 1833, p. 118.

ANTHROPOIDES PAVONINA (Vieill.), Gal. Ois., vol. ii., p. 144. (1834.)

(Plate unnumbered), erroneously figured with red back—

Young figured in plate 257.

BALEARIC CRANE, Bree, Birds of Europe, 2nd edit., vol. v., p. 33.

IN this species the predominant hue of the plumage is blackish, with the conspicuous nude cheek-patch white above, and deep rose-red for the lower half, this red being much more extended than in the other species, as well as differently placed. The throat-wattle, so prominently shown by the living *B. regulorum*, does not appear in the living *B. pavonina*, though represented to do so in the figures cited; its existence would therefore be unsuspected, unless specially looked for. Dr. Bree's figure is also much

too palely coloured, making the bird look too much like the preceding species. In all other respects the two bear a near resemblance to each other, excepting that the present one is notably rather smaller.

It is an inhabitant chiefly of Western Africa, north of the equator. Dr. Bree remarks :

It is with much hesitation that I have admitted this bird into the European list, and I only do so as a doubtful species. It is true we have many accounts of its having been taken at Malta and the Balearic Islands (Majorca and Minorca), from which indeed the generic name *Balearica* was given to it by Brisson, who stated that in his day (1760) it was common in those islands. Swainson, a most accurate writer, says in his "Classification of Birds" (vol. ii., p. 172), that specimens were brought to him in Malta "from the little island of Lampedusa, where they are by no means scarce." Degland admitted it into the European list, and gave Sicily as an additional locality; while Bonaparte, in his "Conspectus of European Birds," introduced it as the representative of the genus *Balearica*, being found in the islands of the Mediterranean. In a private letter, Canon Tristram informs me that of his own knowledge one specimen had been killed in the island of Pantellaria, between Tunis and Sicily, and belonging to the latter. On the other hand, we find Keyserling and Blasius and Schlegel refuse to admit it into the European list; and M. de Selys-Longchamps, in a private letter to me, expresses a doubt of its European title. I think, however, the proof of its occasionally wandering from its African home into European territory preponderates, and I therefore introduce it into my book.

[Since the publication of Dr. Bree's work a specimen was shot at Dalry, Ayrshire, September 17th, 1871 (R. Gray, *Ibis*, 1872, p. 201). This bird is preserved in the collection of Mr. Christy Horsfall. It is stated that, "the greatest care was taken to ascertain that the bird was not an escaped specimen."]

In his "List of the Birds observed in the Islands of Malta and Gozo" (*Ibis*, 1864, p. 142), Mr. C. A. Wright remarks, "The Balearic crane is mentioned by authors as having been met with at Malta, but I have not been able to confirm this." [Nor does Dresser recognise its claim to be admitted into his "Birds of Europe."]

[Mr. Howard Saunders, in a "List of the Birds of Southern Spain," (*Ibis*, 1871, p. 390), remarks :

I am not aware of the existence of a single authentic specimen of *Balearica pavonina* either on the mainland or in the Balearic Islands. Indeed, the only notice of its ever having occurred in the latter is contained in the list of my friend Don Francisco Barceló y Combis, who, however, assured me personally that no specimen had been obtained within his recollection. The evidence upon which this species has been named "*balearica*" is as follows: Don Buenaventura Serra, who died in 1784, states, in his work on the Natural History of the Balearic Isles, that he has heard it said that in 1780 a specimen was obtained at Santa Ponsa, which passed into the hands of Don Cristobal Villela.

If found at all in Eastern or in Northern Africa (which must necessarily be the case if a wild individual has strayed to the isle of Pantellaria), it can only be as an exceedingly rare straggler, for I can

discover no recorded instance of its occurrence in Egypt, Nubia, Abyssinia, or in Eastern Barbary; nor does Canon Tristram include it in his list of the "Birds of the Sahara." [In the *Ibis*, 1860, p. 76, Canon Tristram, in his account of the Ornithology of Northern Africa (The Sahara), states that he "once and once only observed a pair of these fine cranes on the dry sands of the Guerah-el-Tharf, in the month of April.] In the "Histoire Naturelle des Oiseaux de l'Algérie," we read that "ce n'est qu'accidentellement que la Baléarique couronnée a été rencontré en Algérie." So far as I can learn, it would appear to be almost, if not quite, exclusively an inhabitant of Western Africa, and a better account of it than any other with which I am acquainted is that given in Griffith's English edition of Cuvier's "Animal Kingdom," which I abridge to some extent as follows :

This bird, which was brought into Europe about the fifteenth century, from that part of the African coast then discovered, stands about four feet high. It is an inhabitant of the warmest climates. It is found especially in the countries of Gambia [Gambia?], on the Gold Coast, in Fida, at Cape Verd, in Whida, and in the neighbourhood of the river of Ponny, in Guinea. The Africans, who hold it in high veneration, call it the herald of the Fetish, because it makes a noise with its wing (P) something like the sound of a French horn. This bird comes sometimes into the inland to feed on herbs and gather grains. It also frequents inundated places to catch small fish, and feeds, moreover, on earth-worms and insects. Its ordinary walk is slow; but when it avails itself of the assistance of the wind, and extends its wings, it can run with great swiftness. Its flight is also greatly elevated, powerful, and sustaining. It perches in some exposed place in the open air for the purpose of sleeping, like the peacock, which it somewhat resembles in its cry. It has been also very gratuitously termed *Grus balearica*, for nothing proves that there is any analogy between it and the Balearic crane of Pliny, or that it ever inhabited the islands from which the name is derived.

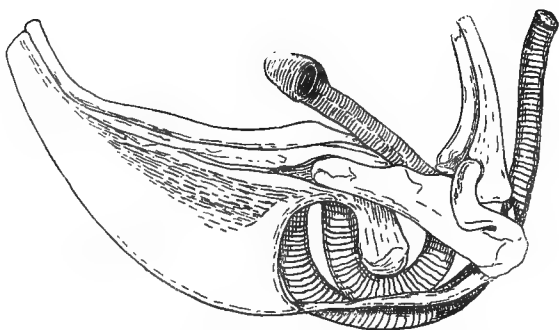
The crowned crane is a mild and peaceable bird in its disposition; it approaches man with confidence and even pleasure; and we are assured that at Cape Verd it is half domesticated, and will come to eat grain with the poultry. Buffon, who brought up in his garden an individual which was sent him from Guinea, says that it used to peck the hearts of lettuces and other plants, but the food which it preferred was boiled rice. Besides the sonorous cry, resembling the sound of a trumpet or horn, it also makes a sort of internal noise, somewhat like unto, though louder, than the clucking of a hen.

[Mr. H. T. Ussher, writing on the Ornithology of the Gold Coast, states (*Ibis*, 1874, p. 73) :

I have observed one or two specimens of this Crane up the river Volta; but it is by no means common. In other districts, as on the rivers Gambia and Niger, it is of frequent occurrence, and is easily domesticated, forming a very beautiful addition to the grounds of the houses of the settlers.]

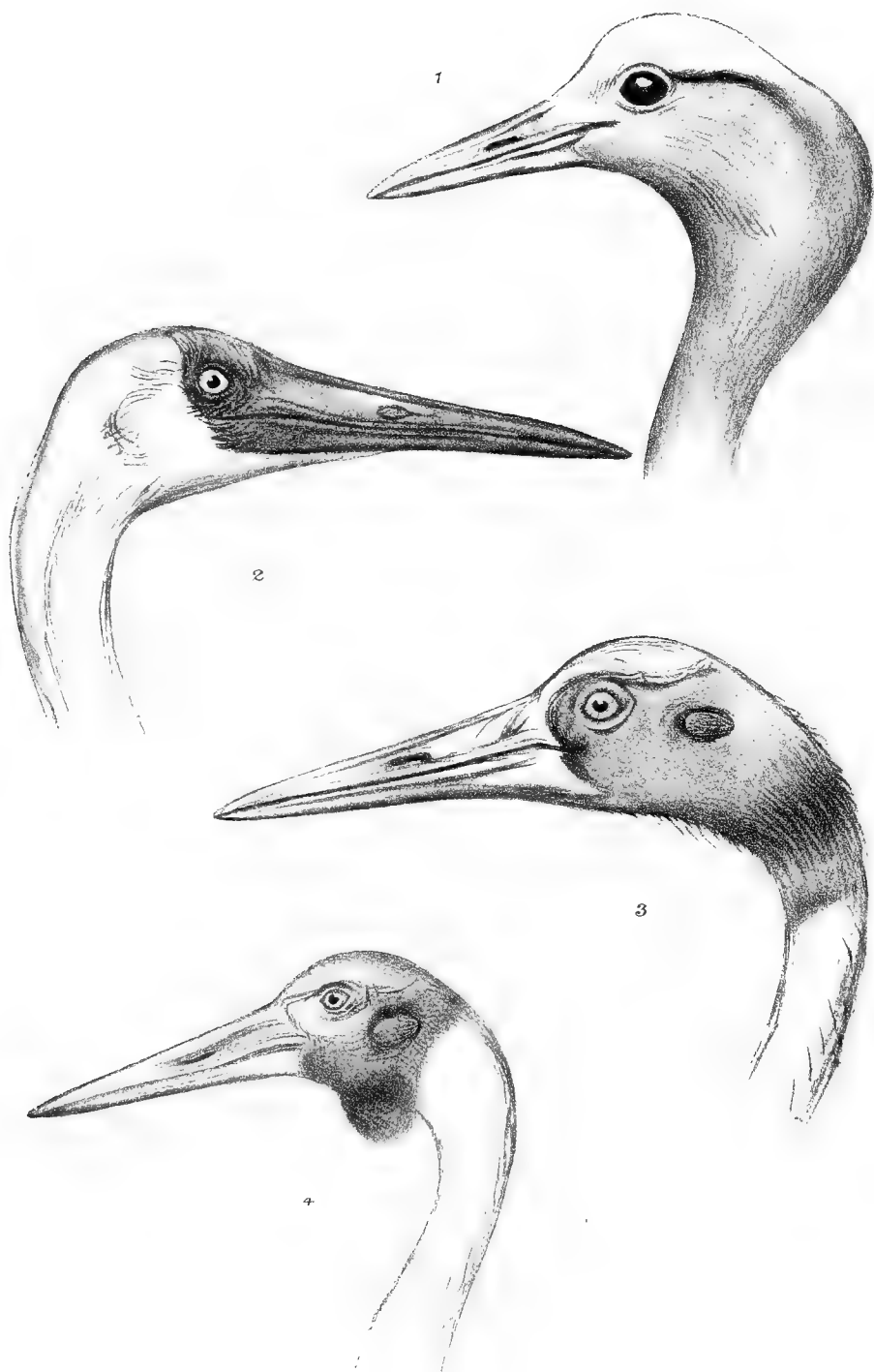
In the dried-up marshes of the Regnegroes this bird is mostly found in company with the white-necked stork (*Ciconia leucocephala*), which is a species common to the Indian region and parts of Africa. It (the former) is there not very rare from January to May (*Ibis*, 1864, p. 430). It is one

of the most commonly exhibited of birds in menageries, and therefore exceedingly familiar to the observation of every visitor to zoological establishments where, in common with other cranes, it is tolerably sure to attract attention, not only by the elegance of its appearance, but by its graceful attitudes and occasional fantastic "dancing." With regard to the "dancing" of the cranes generally, I ought to have remarked previously, that when doing so in apparent pure gaiety of heart and exuberance of animal spirits, they sometimes take up a stick or feather, or some other small object, toss it in the air, and catch it with the bill as it descends, doing this again and again; and they nod and attitudinise most grotesquely and amusingly, though never otherwise than with considerable elegance and grace of action.



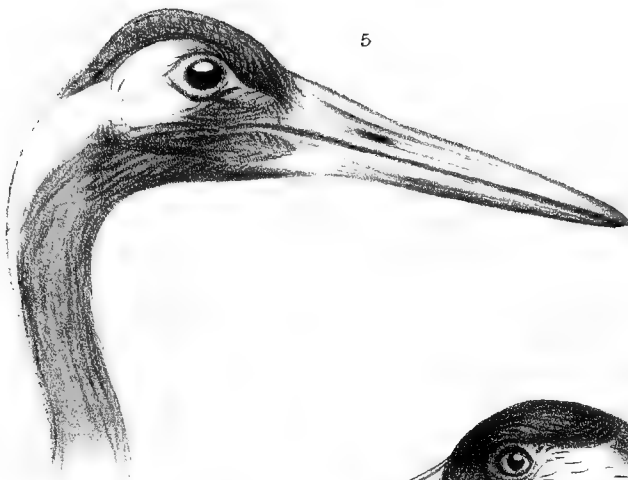
STERNUM AND TRACHEA OF *GRUS PARADISEA*.

After Yarrell, *Trans. Linn. Soc.*, vol. xv.

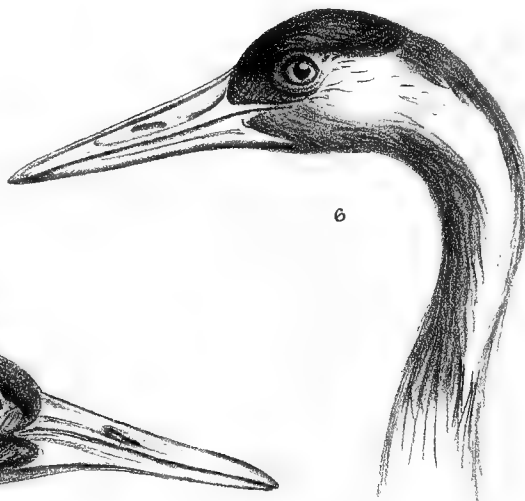


1. *Grus paradisea*
2. „ *leucogeranus*.

3. *Grus antigone*.
4. „ *australasiana*



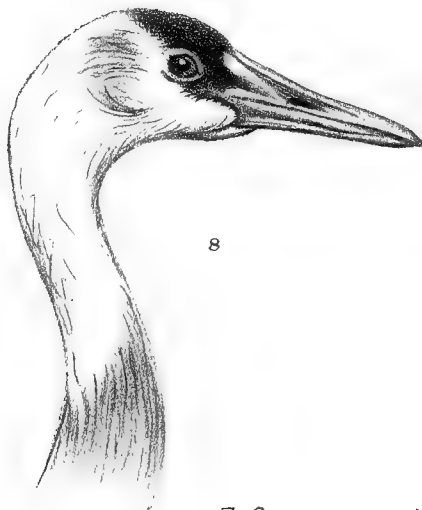
5



6



7



8

5. *Grus viridirostris*
6. „ *communis*

7. *Grus americana*.
8 „ *monachus*.

II. — GRUS.

THE ordinary cranes have (with one exception) an elongated trachea, which forms a convolution within a cavity in the keel of the breast bone, as in the trumpeter group of swans, and more especially as in the Hooper *Oygnus musicus*. The bill is longer than in the crowned cranes, with the nostrils considerably more elongated; the plumage is smooth and compact, mostly of a blue grey or white, with more or less of black, and tipped with rusty edgings to the feathers in yearling birds, while the tertiaries are in some of the species elongated and drooping, in others of more or less open texture, and in one sub-group erectile.

Following the crowned cranes, there are two species which have the bill comparatively short, and which also have lengthened pointed feathers pendent from the breast; the convolution of the trachea within the keel of the breast bone is not to so great an extent as in the others (with the extraordinary exception of *G. leucogeranos*). The face and crown are wholly feathered, and the tertiary plumes of the wing are much elongated, so as commonly to be mistaken for the tail when the wings are closed. Both are African, but one of them is equally Asiatic. By some ornithologists these two species are recognised as constituting a genus styled *Anthropoides* by Vigors, while the larger of them is again separated by others under the name *Tetrapteryx*; unsuitable as well as needless appellations.

GRUS PARADISEA (LICHT.).

STANLEY OR PARADISE CRANE.

ARDEA PARADISEA, Licht. Cat. rerum. natural. rariss. Hamburg, p. 28. (1793.)

TETRAPTERIX CAPENSIS, Thunberg. Vetensk. Akad. Hand. Stockh., p. 242, t. 8. (1811.)

GRUS PARADISEA, Licht. Verzeich. d. Doubletten d. Zool. Mus. Berlin, p. 78. (1823.)

ANTHROPOIDES STANLEYANUS, Vigors, Zool. Jour., vol. ii., p. 234, pl. viii. (1826.)

GRUS CAPENSIS, Lesson. Traité Ornith., p. 587. (1831.)

SCOPS PARADISEUS, Gray, Genera of Birds, vol. iii., p. 553. (1845.)

GERANUS PARADISEUS, Bonaparte, Consp. Avium, vol. ii., p. 101. (1857.)

THE BLUE CRANE of South Africa.

This elegant species stands about 4½ft. high at the crown, and its lengthened tertiaries reach quite, or very nearly, to the ground. The

female is conspicuously smaller. The feathers of the head are close, and commonly puffed up so as to increase remarkably the apparent size of the head, imparting somewhat of a bladdery appearance to the surface, which seems to distend more or less as the feathers are raised or depressed. Plumage wholly of a soft leaden blue, with the exception of the upper part of the head, which is white, and the ends of the long drooping tertiaries, which are black; the cheeks are whitish, passing into nigrescent on the upper half of the neck and ear coverts, the latter being separated from the white cap by a blackish line; feathers of the lower back elongated; irides dusky; bill and legs black; length (as given by Mr. Layard) 4ft. 4in.; of wing to extremity of drooping plumes, 3ft. 10in.; tail 14in. According to Chapman, this bird weighs 12lb., and the expanse of its wings is about 7ft. In the figure published in the *Zoological Journal* (*loc. cit.*) the legs are represented much too short, and the length of the drooping plumes is exaggerated. In the young bird the head is white, inclusive of the cheeks and throat, the somewhat lengthened tertiaries are brownish, and the flight feathers dusky. The trachea of this species is figured and described by Yarrell in "The Transactions of the Linnæan Society" (vol. xv., p. 380), its convolutions are less developed than in most of the other species of *Grus*. At the time Mr. Yarrell wrote the bird was considered somewhat, or more than somewhat, of a rarity. He remarks:

One example only of the rare bird above mentioned appears to have been brought alive to this country [*i.e.*, in 1827]; and this specimen will be found described and figured by Mr. Vigors in the second volume of the *Zoological Journal* (p. 234), under the name of *Anthropoides stanleyanus*. . . . Possessing as this bird does to a great degree the external character of the Demoiselle, it also bears some resemblance to it in its anatomical structure. The trachea, quitting the direction of the vertebræ of the neck at the lower part, passes downward and backward between the branches of the furcula till it reaches the anterior edge of the keel; it then turns upwards into a groove formed for its reception, and, being reflected forward and downward, traverses the projecting portion of the sternum, and passes backward to the lungs. The furcula is similar to that of the Demoiselle. Dr. Latham's figure of the sternum and trachea of the common European Crane being referred to, and compared with the same parts in the Demoiselle and the Stanley cranes, it will be perceived that the insertion of the windpipe in the latter bird is upward, that of the Demoiselle principally backward, while that of the Common Crane will be found to be a compound of both, combining the upward inclination of the one with the backward insertion of the other; and the depth of this insertion within the keel appears to depend on the age of the bird rather than the sex. In a very old female of the Common Crane, of which I prepared the bones, the insertion is carried to the utmost extent that the size of the sternum will admit. In a second specimen of a younger male bird, the insertion was not so deep as in that last mentioned, but still much more so than in the sternum represented by Dr. Latham; and in the valuable and extensive collection of Joshua Brookes, Esq., there is a sketch of the Common Crane—evidently a young bird by the state of the bones—in which the insertion is not carried so far as in the representation alluded to; but in a male and female of the same age the greater depth of insertion may occur in the male, as stated in Dr. Latham's paper.

[I have given on p. 22 a reduced drawing of Yarrell's figure of the trachea and sternum of *G. paradisea*, in the "Linnean Transactions," to illustrate the above passages.—W. B. T.]

This superb crane is peculiar to South Africa. According to Mr. Layard ("Birds of South Africa," p. 303),

The "Stanley" or "blue" crane is not abundant in any locality, but seems very generally distributed. I fancy that certain pairs frequent the same district for the whole term of their lives, and may always be found within a certain radius. I saw it thus continually at Kel's Point, and at the Knysna. It is wary and difficult to approach within gunshot, but may always be obtained with a rifle. It goes in pairs, the female being considerably the smaller; when in confinement it becomes very tame, and feeds readily from the hand, eating bread, fruit, vegetables, &c. Its harsh, rattling, guttural cry may be heard at an immense distance. In a state of nature it feeds on fish, reptiles, locusts, and small mammalia, and is often found inhabiting the Karoo country at a great distance from water. Mr. Arnot has forwarded eggs from Colesberg, and informs me that it breeds in that neighbourhood in some abundance. The eggs resemble those of *G. carunculata* in every particular.

Mr. Ayres, writing from the Trans-Vaal, states (*Ibis*, 1871, p. 270):

These cranes are not at all uncommon in this country. In the summer months they are generally seen in pairs, stalking about the open flats in search of insects; in winter they congregate in certain localities and live socially together. One of these spots is the Movi river, about ten miles above its junction with the Vaal river, and another is on the banks of the Vaal River, about twenty miles below Bloemhoff. These birds feed on seeds and roots (bulbs) as well as on insects, and their flesh is not at all bad eating; slices from the breast fried with butter are scarcely to be distinguished in taste from excellent beef. Sometimes these cranes rise to an immense height in the air, uttering their peculiar loud guttural note. When on the ground they frequently amuse themselves by dancing round each other with wings extended, bowing and scraping to each other in a most absurd manner, not a little curious to see.

A familiar spectacle, however, with any species of crane in zoological establishments where the birds are not too much cramped for space. Mr. Andersson records that

This very graceful crane is not uncommon in Damara and Great Namaqua Land during the rainy season, but migrates on the return of the dry. It is found in the open country, as well as in the moist beds of periodical streams, and always in pairs. It is rather a timid bird, and is rarely to be obtained except by the rifle. The stomachs of the few individuals which I have opened contained nothing but insects and a large quantity of gravel. ("Birds of Damara Land," &c., p. 279.)

In the *Ibis* for 1869 Mr. Layard quotes his correspondent Mr. Ortlepp, who writes of the present species, that "their principal food consists of small bulbs; when they have the chance they pass the night sleeping in the water knee-deep, and in the winter months are frequently found with their legs frozen fast in the ice." They should accordingly be tolerably hardy and endurant of cold—indeed, more so than seems generally to be the case with them in European vivaria.

[Mr. T. A. Barratt, in his notes on the birds of the Lydenburg district (*Ibis*, 1876, p. 209) :

I have met with it in great quantities between Blomfontein and Potchefstroom; in the winter I have seen so many as fifty in a flock, beside many more in the neighbouring vleys . . . Their long drooping feathers are readily bought by traders from up the country, who sell or exchange them to the native tribes. They become very tame in confinement, and will eat out of the hand and follow one about. I have never shot them further north than within a few miles south of Lydenburg.

A figure of the head of this species is given in Plate I, figure 1.]



GRUS VIRGO (PALL.).

THE DEMOISELLE CRANE.

GRUS NUMIDICA, Virgo Numidica vulgo dicta., Briss. Orn., vol. v., p. 388. (1760.)

ARDEA VIRGO, Linn., Syst. Nat., vol. i., p. 234. (1766.)

GRUS VIRGO, Pall. Zoogr. Rosso-As., vol. ii., p. 108. (1811.)

ANTHROPOIDES VIRGO, Vieill. Nouv. Dict., vol. ii., p. 163. (1816.)

SCOPS VIRGO, G. R. Gray, List of Gen. of Birds, p. 86. (1841.)

LA DEMOISELLE DE NUMIDIE; Hist. Nat. Ois., vol. vii., p. 313, pl. 15. (1780.)

THE DEMOISELLE OF NUMIDIA, Edwards, Nat. Hist. Bird., vol. iii., p. 134. (1750.)

This graceful species is figured by Edwards in 1750, pl. 134; and in Gould's

"Birds of Europe," pl. 272. This later figure is copied in Dr. Bree's "Birds of Europe," &c., vol. iv., p. 27. It is the smallest of all the cranes, and it is distinguished from every other species by its long and very copious white ear-tufts, which nearly meet at the nape, and are composed of feathers with disunited webs, as also by its conspicuously bright vermilion irides. Like its near congener the Paradise Crane of South Africa, it has long and pendent breast-plumes. General colour pearl-grey, inclusive of the crown and lower portion of the neck behind; the rest of the head and neck, with the pendent breastplumes, black, as are likewise the terminal half of the wing primaries and the lower portion of the long, narrow, pointed and drooping tertiaries; a white line is continued from behind the eye to the white auricular tufts. Bill greenish at the base, yellowish in the middle, and inclining to red at the tip; legs black. Length variable, of a large male about 3½ft., of a small female much less; expanse of wings from 4½ft. to over 5ft.; bill at front 2¼in. to 2½in.; tarsi 6½in., more or less. Weight about 6lb. Young, grey, with some black only in front of the neck and upon the flight-feathers, the ear-tufts being only slightly indicated. In some instances I have observed remarkable disparity of size in the sexes of this species, but in general that disparity is not particularly noteworthy.

The Demoiselle Crane is a migratory species, with a very extensive range of distribution according to season. To restrict to it, therefore, its old appellation of "Numidian crane" is not desirable. In the list of Mongolian birds prepared by M. l'Abbé Armand David, which is published in the "Nouvelles Archives du Muséum d'Histoire Naturelle," tome iii. (1867), we are informed that this "jolie grue" is very abundant at Suen-Hoa-Fou in spring and autumn, and that it breeds in Mongolia, not far from water. In the *Zoologist* for 1863, p. 8692, we read of a pair straying to Orkney, one of which was shot, and it appears that they were so wild that it is not at all likely that they had escaped from captivity. "The gulls and lapwings continually attacked the two strangers whenever they walked or winged their way over the grass and oat-fields, and they were heard frequently to utter a hoarse scream when thus persecuted by their tormentors."

[Dresser states, "The only recorded occurrence of the Demoiselle or Numidian crane in Great Britain is that of one which was shot at Deerness, near Kirkwall, on the 14th of May, 1863, and is now in the possession of W. Christy Horsfall, Esq., of Horseforth Low Hall, near Leeds, Yorkshire. —(*Birds of Europe*, 1879.)]

Another was picked up dead on the banks of the River Cole, near Wincanton, in February, 1876 (*Zoologist*, 1876, p. 4928.)

Professor Blasius, however, had previously recorded the occurrence of the Demoiselle Crane in Heligoland, as noticed in the *Ibis* for 1862, p. 71; but I do not hear of its having been observed in Scandinavia. Mr. Gould's fourth volume of his "Birds of Europe" bears date of 1837, and

we were then told by that ornithologist (who accepts the proposed genus *Anthropoides* for the reception of this and the preceding species) that "Africa is undoubtedly the true habitat of the members of this genus, of which the bird here figured is a typical example; at the same time," he adds, "that the range of the present species is exceedingly extensive is proved by the circumstance of our having lately seen a specimen killed in Nipâl, and we are of opinion that it is also sparingly dispersed over other parts of India." Strange to say, it is included neither in Major James Franklin's "Catalogue of Birds (systematically arranged) which were collected on the Ganges between Calcutta and Benares, and in the Vindhyan hills between the latter place and Gurrah Mundela, on the Nerbudda," which was published in the Proceedings of the Zoological Society for 1831, nor in the late Col. Sykes's catalogue of those which he observed in the Dukhun, which appeared in the same Society's proceedings for 1832; and it was not until 1840 that that portion of Dr. Jerdon's "Catalogue of the Birds of the Peninsula of India" appeared in the *Madras Journal of Literature and Science*, that we were told by him that "This most elegant and chastely-coloured bird is found over most of the peninsula of India during the cold weather, and in much greater numbers than either *G. antigone* and *G. communis*. Like these, it is most abundant in the neighbourhood of the larger rivers, and has similar habits and food." In the third volume of the same naturalist's "Birds of India" (published in 1864), he remarks:

This beautiful crane is found throughout the greater part of India, is more rare in the extreme south, and is never seen in Malabar nor in Lower Bengal; one writer says that it is never met with below Dinapore. It is a cold-weather visitor generally, only coming in late in October, and its arrival, like that of *G. communis*, is hailed with joy as a sure sign that the cold weather is indeed come. It associates in numerous flocks, from fifty to five hundred, and chiefly frequents the vicinity of rivers, as it invariably, according to my experience, betakes itself during the heat of the day to drink and rest, and never to tanks or jheels, as the sárás and common crane do. [In reference to this statement Capt. Butler, of the 83rd Regiment, says: "This is an erroneous impression, as I have seen tanks fringed with a blue margin of these birds at least sixty yards wide, and extending over several acres of ground."] It is very destructive to grain fields, especially to wheat in Central India, and to chenna (*Oicer arietinum*) in the Dukhun. These birds fly with great regularity, either in a long continuous line or in a double wedge-shaped line, and then utter their fine clanging note frequently.

Latham in his "General History of Birds," vol. ix., p. 29, tells us that "this is a common species in India, being seen with the Indian crane [meaning the European crane] in vast flocks, on the banks of the Ganges (Pennant, Ind. Zool.), where it is called '*Curcurna*,' and '*currakeel*.' Pocock," he remarks, "styles it the Dancing Bird." In his "Notes on Birds observed in Oudh and Kumaon," Major Irby remarks that the Demoiselle Crane "occurs in immense flocks during the cold season, being found in the same localities as *Grus communis*. At Sirsa Ghât, on the

Choka, flocks of several hundreds may be seen on the wing at once ; their cry can be heard when they are out of sight :” (*Ibis*, 1861, p. 243.)

In his “Notes on the Habits of some Indian Birds,” published in the Proceedings of the Zoological Society for 1855, Lieut. Burgess remarks that :

This crane visits the Dukhun during the cold weather, but sometimes remains as late as May. I saw a large flock of them on the river Seena, near Waterphul, as late as 24th May, and was told that one had been brought into the cantonments of Ahmednuggur as late as the 12th June, but I never heard of any remaining to breed. The greater portion leave the Dukhun at the end of March or beginning of April, and return at the end of November. They feed in the grain-fields, retiring to the larger rivers about ten o'clock, where they may be seen standing in large flocks in the shallows.

[Mr. Hume saw the Demoiselle Crane once in Sindh, close to the Muncher Lake. According to Mr. R. M. Adam it visits the Sambhur Lake in large flocks during the cold weather, and Capt. Butler says the same of Northern Guzerat, where it arrives about the end of the first week in October. “*Stray Feathers*,” i., 235, 395 ; v., 232.]

In the *Bengal Sporting Magazine*, for February, 1837, a pair are figured, somewhat rudely perhaps, but the flight of a descending flock is characteristically represented. In the accompanying notice of the species the author writes :

The coolen possesses a recommendation not common to all birds—namely, it may not only please the taste of the lovers of the fowling piece, but likewise suit the palate of the epicure. They are almost always to be seen in large flights (similar to those of geese), frequenting, in the daytime, the large beds of sand of the Jumna, Chumbul, Soane, and other rivers of Western India, and at night feeding in the corn-fields, which they damage very considerably. They are very shy and difficult to approach in flights, and there is always one of them on the look-out for the enemy. I have, however, sometimes found one or two alone on the skirts of a *fewar* field, and thus an occasional bird may be shot. Occasionally I have seen a stray bird or two feeding along with the sárás. They fight furiously when on the ground wounded, and the sportsman should be careful in not laying hold of the bird in too great a hurry. As a bird of game flavour it is inferior to none in India, not even excepting the bustard and florikan [*Otis nigriceps* and *O. deliciosa*], and to the lover of a real delicacy the coolen is well worth the trouble in obtaining. These birds come in about the beginning of November, and continue during the cold season, but disappear altogether on the approach of the hot winds.

When this bird is struck by a *bhyri* (*Falco peregrinus*), remarks Dr. Jerdon, “its mate generally comes to its assistance. The *bhyri* always strikes it on the back and wings, to avoid being wounded by the sharp inner claw, with which, if struck on the head, it generally manages to inflict severe wounds on the breast of the falcon.” He adds : “The inner claw of all these cranes is much hooked, and exceedingly sharp, and it always in self-defence strikes with its claw, and never with the bill.” We have seen that the American White Crane (*G. americana*) can use its

bill with fatal effect. Jerdon further remarks that "the *karkarra* makes a fine flight with the *bhyri*, occasionally two or three miles."

Sir Walter Elliot in a note (cited by Jerdon), remarks that this species Flies in vast flocks, from 50 to 100 and even 500, with great regularity of arrangement, in a long line, a few of the leading ones disposing themselves in another line at an angle, varying from a right to an acute one, with it. This is when they are in progress; at other times, as when disturbed during the heat of the day, they may be seen circling round at a great height, but still a regular order of lines may be distinguished. Their favourite food is chenna (*Oicer arietinum*). They never go to tanks to drink, but always to rivers.

[The frontispiece to this monograph representing a Flock of Demoiselle Cranes, on a sandbank near Aboo Girgeh, Middle Egypt, was sketched on March 24th, 1874, by Prof. W. H. Flower, who informs me that :

Though all the birds seen during the three months spent on the Nile, January, February, and March, 1874, were carefully noted, not a single Demoiselle Crane was observed except on this day, when they were literally in thousands. The common crane (*Grus communis*) was often seen, but always in small numbers at a time.

The small figure at the commencement of this section is copied from that of Harvey in *The Gard. and Menag. Zool. Soc.*, Vol. ii. p. 231. 1835.]

Prof. Nordmann in Demidoff's "*Voyage dans la Russie Méridionale*" has given a highly interesting account of the habits of these cranes when they are assembled on the Russian Steppes after their flights. They arrange themselves in a circle or in many rows, when they will bow and dance to each other in a most grotesque manner. According to Nordmann (as translated by Dr. Bree)

They arrive in the South of Russia about the beginning of March, in flocks of between two and three hundred individuals. Arrived at the end of their journey, the flock keeps together for some time; and even when they have dispersed in couples, they reassemble every morning and evening, preferring in calm weather to exercise themselves together, and amuse themselves by dancing. For this purpose they choose a convenient place, generally the flat shore of a stream. There they place themselves in a line, or in many rows, and begin their games and extraordinary dances, which are not a little surprising to the spectator, and of which the account would be considered fabulous were it not attested by men worthy of belief. They dance and jump around each other, bowing in a burlesque manner, advancing their necks, raising the feathers of the neck-tufts, and half unfolding the wings. In the meantime another set are disputing in a race the prize for swiftness. Arrived at the winning-post they turn back, and walk slowly, and with gravity; all the rest of the company saluting them with reiterated cries, inclinations of the head, and other demonstrations, which are reciprocated. After having done this for some time, they all rise in the air, where, slowly sailing, they describe circles, like the swan and other cranes. After some weeks these assemblies cease, and from that time they are constantly seen walking in loving pairs together.

[The following graphic account of the habits of the Demoiselle Crane during the breeding season was given by Dr. A. S. Cullen in his "*Notes on the Nesting of Birds in Bulgaria*" (*Field*, September, 1869) :

This bird arrives in the Dobrudsha in about the second week of April. It makes its

appearance in flocks of from twenty to thirty birds and upwards, and the form of these flocks very much resembles those of the common crane, and they almost always fly very high, especially when passing wooded country; but when crossing the plains they fly lower, and occasionally come within gunshot. For the first week after their arrival flocks of these birds mingle with those of the common crane, and resort to any fields of newly-sown grain that they can find, and to these they often do great damage. Regularly once or twice during the day they repair to some lake or pond of fresh water to drink. In the evening the fields are deserted, all the birds going to the nearest lakes or marshes, where, I believe, they remain all night. About the second week after their arrival the flocks break up into pairs, which disperse themselves all over the country. Very soon after the birds have paired they begin to lay. Eggs may be found from about the third week in April to very nearly the end of May; but much depends on the state of the weather. The nest of the Demoiselle Crane is, without exception, made on the *ground*, usually amidst some kind of young grain, but often amongst grass on fallow land, and now and then, though more rarely, amongst stubble. The nest—if indeed such it can be called—is made by the birds pulling up or treading down the grain, grass, or stubble for the space of about two feet, and scratching the shallowest possible hollow in the middle of the bare patch thus formed. A few small straws and stones are often found in and about this hollow, but whether they are brought there by the birds, or found there by them, which is very probable, I cannot say with any certainty.

I believe myself, however, that they are placed there by the birds. The eggs, which are never more nor less than two in number, are *always* placed side by side, in the hollow already described, with their small ends pointing in the same direction. The male assists the female in hatching the eggs; indeed, I have every reason to think that he sits as much as the female. To the uninitiated in the habits of this bird, its eggs are very difficult to find. When an intruder approaches the spot where the eggs lie, he at first sees nothing except perhaps a solitary bird standing on one leg as if sleeping. Should he not be a very good observer, as he draws nearer he will probably only notice a pair of birds walking rapidly away, plucking the grass as they go, apparently feeding eagerly, and he will most likely account for the sudden appearance of the second bird by concluding that it had been sitting on the ground resting, and will not think anything about the matter, and pass on. Very few persons indeed would at all suspect that the birds had a nest. Often, nay, almost always, when the birds have placed some distance between them and their nest, they will take flight, and to all appearance desert the spot altogether, but no sooner is the intruder's back turned, than there they are again in a wonderfully short space of time. One of the birds, I believe the male, always keep watch over the other, except in the middle of the day in very hot weather, when the bird, which acts as sentinel, deserts its post and goes to the nearest pond or lake to drink. It does not, however, remain away very long.

Should the bird whose place it is to watch while the other sits be absent, the sitting bird when disturbed is not quite so guarded in its movements, and will allow a much nearer approach. When the eggs are first laid the birds will leave them as soon as an intruder comes in sight, but as the incubation advances they become less shy, and will not leave their eggs so readily.

I cannot say whether the bird which watches stands close to or a little distance from the nest. I rather incline to the latter opinion. If a crane be observed chasing other birds away from any particular spot, it is a sure sign that it has a nest not far off. This bird will give chase to eagles and great bustards without the least fear should they venture near its nest. For all kinds of harriers and seagulls it has a great dislike. I have been told by the Tartars that, should a dog by chance go near the nest of this bird, both the birds will attack him, striking him with their beaks and wings, and making a great noise all the time. I myself have never had an opportunity of witnessing such

an interesting encounter, but I am certain that this bird has sufficient courage for one. The Demoiselle crane is easily domesticated when young.]

The eggs of *G. virgo* have been carefully described by Dr. Bree. As before stated, they are smaller and more elongated than those of the common crane. Dr. Bree (*Field*, September 11, 1869) writes as follows :

Mr. Cullen has kindly sent me six specimens for comparison, and with four in my own collection, two of them from Mr. Cullen and two purchased from eggs sent home by Dr. Cullen, I am able to give a fair description of the egg. The size varies from three inches and four-fifths to three inches and two-fifths in length, and two inches and a fifth to two inches in breadth. The ground colour is a dirty pale green, and they are more or less thickly marked with spots and blotches of umber brown—in some cases more thickly at the larger end, while in others no such accumulation is seen, the blotches and spots being more regularly diffused. In addition to the brown umber marking there are blotches of a fainter dark colour. In one variety the egg is of a uniform light cinnamon brown colour, thickly marked with spots of the same colour, but darker; and in two specimens in my collection sent me by Mr. Cullen the ground colour is of a darker colour, and the spots and blotches have a bronzy appearance, giving the egg somewhat the appearance of that of the great bustard. Some of the eggs have blotches, others 'spots predominant; the latter rarely. One specimen sent me by Mr. Cullen is almost entirely and uniformly spotted with brown upon a pale dirty green ground. When the eggs are thickly marked at the larger end, the other parts are freer from blotches or spots. All the eggs are more or less glossy.

Though its geographic range extends to North Africa, it is decidedly more of an Asiatic than an African species, being found abundantly (as we have seen), even so far eastward as Mongolia, where it breeds, and it is sure to occur more or less in Manchuria and the huge realm of China. As Dr. Bree remarks, "it is not rare in Turkey, plentiful in Persia, and eastward inhabits the continent of India" (but only as a winter visitant). "It is found in the south of Russia, in Greece, Turkey, and occasionally in Dalmatia," (and, as a rare straggler, in) "Switzerland, the South of France, and Heligoland. It is also found in various parts of (Northern) Africa. Mr. Salvin notices having seen small flocks in the eastern parts of the marsh of Zana. Canon Tristram also met with it in the north, and Capt. Loche records its occurrence in the south of Algeria. "Dr. Leith Adams informs me," continues Dr. Bree, "that it has several times been shot in Malta during the cold season." My late friend M. Alfred Malherbe, in his "*Faune Ornithologique de la Sicile*," also states that it appears "accidentellement" in Malta and on the western and southern coasts of Sicily. According to Temminck, it has been killed both in Piedmont and Switzerland. Capt. Shelley, in his "*Handbook of the Birds of Egypt*," remarks that "this crane ranges throughout Egypt and Nubia, but is far less plentiful than the Common Crane, and nearly as shy." Over a considerable part of India, as already remarked, it is by far the most abundant species of its genus. There it is most commonly known to our countrymen as the *coolen*. "The name *kllung*," however, as the late Dr. Jerdon remarked, "transformed into *coolen*, is wrongly applied to this species by many sporting

writers, it being always used for the Common Crane by falconers and the best *shikárris*. The name *karkarra*," he continues, "appears to be nearly the same word as is used by the Mongols of Central Asia according to Pallas, viz., *karkarror*, and is evidently an imitation of its call."

The various other cranes have more or less of nude skin upon the head (at least when adult), which is mostly crimson and papillose, and to a greater or less extent beset with black setaceous or bristle-like unwebbed shafts. They fall into two distinguishable sub-groups, one of which is exemplified by the well-known Sárás Crane of Asia, and the other by the ordinary European Crane.

The Sárás sub-group consists of species of large size, with non-erectile tertiaries, the vanes of which are at most discomposed to a very slight extent. They are peculiar to the major continent with Australia.

GRUS CARUNCULATA (Gmel.).

THE WATTLED CRANE.

ARDEA CARUNCULATA, Gmelin, Syst. Nat., vol. ii., p. 643. (1788.)

GRUS CARUNCULATA, Vieillot, Encycl., Méth., p. 1140. (1823.)

BUGERANUS CARUNCULATUS, Gloger, Handbuch Natur., p. 440. (1842.)

ARDEA PALEARIS, Forster, Descr. Anim., p. 47. (1844.)

GRUS CARUNCULATA, Gray and Mitchell, Gen. Birds, vol. iii., p. 552, col. plate 148. (1845.)

ANTIGONE CARUNCULATA, Bonaparte, Consp. Av., vol. ii., p. 100. (1857.)

LAOMEDONTIA CARUNCULATA, Reichenb. Syst. Avium., p. xxiii.; Wasserhühner und Rallen, fig. 2691.

THE CAFFRE CRANE of South Africa.

This stately species of crane is conspicuously distinguished from all others by having a remarkable pendent lappet of skin on each side of the throat. It is the third and last of the cranes inhabiting Southern Africa. It stands about 5ft. high when erect, and its drooping tertiaries are proportionally longer than in *G. virgo*. Its general colour above is grey slate, darkest on the back, at the end of the wings, and the top of the head; neck, pure white; the rest of the plumage black. The smallest of the tertiaries which overlie the drooping plumes are to some extent discomposed. The fore part

of the head is bare, red, and papillose. The two flaps of skin which depend from the sides of the chin are covered, except in front, with short white feathers. Irides bright orange, somewhat redder in the male; bill reddish, legs and feet dull black. There is hardly any perceptible difference between the sexes. As seen from a little distance, the birds appears grey, with a white neck and broad black zone crossing the shoulders. The length (as given by Mr. Layard) is 4ft. 7in.; wing to end of drooping feather, 3ft.; tail 13in.

[Gloger, in his handbook, p. 440, suggested the separation of the Wattled Crane from the genus *Grus*, writing :

A South-African species of the same size [as *G. communis*], but slate grey, with a white throat edged with black (*Gr. carunculata*), should perhaps be generically separated (*Bugeranus*). For it has not only a bright-red naked face, but also a kind of throat-sac, and on each side a feathered bell-like fleshy caruncle of an inch and a half in length.

The establishment of a new genus on such slight differences, however, appears unnecessary, and has not been accepted.—W. B. T.]

Layard, in his *Birds of South Africa*, remarks :

This great crane is only found in a few favoured localities, scattered over the country. A single pair take up their haunts and maintain their place of abode for years, breeding constantly in the same nest, which is repaired as occasion requires. I had the pleasure of watching a pair, through my binoculars, engaged in this proceeding. Both birds contributed to the work, stopping now and then to do a little courting. Two eggs were taken from their nest.

The notice by Mr. T. Ayres of this species nesting in five feet of water has also been duly quoted at page 5. He had previously remarked that in the Natal colony—

The Caffre Cranes are plentiful inland, but are seldom if ever seen on the coast. They may be found in the open plains, sometimes singly, at other times twenty or thirty in a flight. They appear to feed on grain and insects, preferring the former when attainable. They fly with neck and legs outstretched, the beat of their wings being very quick considering the size of the bird; and during their flight, if in sufficient numbers, they form the usual letter V, like swans and geese: (*Ibis*, 1864, p. 355.)

Andersson, in his "Birds of Damara Land," p. 278, says :

This crane is found very sparingly in Damara Land during the rainy season; I have also observed it on the rivers Okavango, Teoughe, and Dzonga, as well as at Lake Ngami.

It is a somewhat rare species in the *vivaria* of this part of the world; but examples have been included in the Regent's Park collection.

GRUS LEUCAUCHEN (TEMM.).

THE WHITE NAPPED CRANE.

GRUS LEUCAUCHEN, Temm. pl. col. 449. (1828.)

GRUS ANTIGONE, Pall. Zoogr. Ross. Asiat., vol. ii., p. 102. (1811.)

GRUS JAPONENSIS, Briss. Ornith., vol. v., p. 381, pl. 33. (1760.)

ANTIGONE LEUCAUCHEN, Bonap. Comp. Rend., vol. xxxviii., p. 661.
(1854.)

KARAN of the inhabitants of Dauria.

TANCHO of the Japanese.

[Mr. Blyth, in his paper published in the *Field*, described the species under the name of *Grus Antigone* (Pall.); but Mr. P. L. Selater, in some manuscript notes on the monograph with which he has favoured me, writes as follows :

Mr. Blyth appears to have overlooked the fact that the name *Antigone* was appropriated by Linnæus to the "Greater Indian Crane" of Edwards long before Pallas gave the same name to the "White-naped Crane" of Northern Asia.

There is, therefore, no justification for Mr. Blyth's proposal to call the latter bird *Grus antigone*. That name should be retained for the Indian species.

Schlegel, in the Mus. Hist. Nat. Pays-Bas, Ralli p. 3, gives *G. leucauchen* Temm. as a synonym of *G. Vipio*, Pall. Zoogr. Ross. Asiat., vol. ii., p. 111. This uncertain species is described from the MS. of Gmelin, sen., who termed it *Grus minor albus*, and is suggested by Pallas to be the young of the white-naped crane which he (Pallas) termed *G. Antigone*.—W. B. T.]

In this noble species, which stands nearly 5ft. high when erect, the tertiary feathers of the wing are somewhat lengthened, attenuated, and drooping ; and its general coloration bears a considerable resemblance to the wattled crane of South Africa ; but it shows no trace of the wattles, which are altogether peculiar to that species. It has the dull green bill and the dull pink legs of the two Indian Sárás cranes, and the body plumage is much of the same grey colour as in those birds, being distinctly paler on the tertiaries and darker on the under parts ; the irides are also similarly bright orange-yellow ; but the dull greyish coronal shield is wanting, and the face only is bare, crimson, and papillose (much as in the wattled crane), with copious black setaceous shafts of feathers towards the bill, there being also a continuous moustachial mark of similar blackish setaceous shafts ; ear-coverts grey ; crown and entire hind part of neck, with the chin and throat, pure white ; the front of the neck and the lower parts dark ashy, ascending laterally to a point a little below the ear-coverts, while the white of the crown terminates forward in an obtuse point between the eyes. Tail with a dusky terminal band. Sexes differing but slightly in appearance,

though the somewhat lengthened and attenuated tertiaries are both more lengthened and much whiter in the male than in the female.

The White-naped Crane is distinctly and incontestably the species described by Pallas as *Grus antigone* [but which name had previously been given to another species]. He describes it to inhabit the watery districts of Dauria, especially about the Argun and Dalai-noor, where the Common Crane is likewise met with. It is said to make its appearance sometimes in the Astrakhan desert, and in those of Great Tartary, for it is not unknown to the Kirghiz. According to Pallas, this bird is never gregarious, (!) —he must surely mean in the breeding season; but the kindred *Sárás* cranes of India are oftener seen in pairs than in small flocks. This bird is the sacred crane of the Japanese, which is so very generally represented in its various picturesque attitudes in their works of art: [see vignette on page 13.] It also occurs in the north of China, having been noticed by Père David to pass in small numbers along the mountains of Seu-en-hwa-foo. It is likewise enumerated among the birds of Dauria, of Amur-land, and of Eastern Siberia (Journ. f. Orn., 1870, pp. 175, 310). The London Zoological Society received the first ever brought alive to this country, though the species had been previously exhibited in the Amsterdam vivarium. In the paddock in which they are placed they can be seen to great advantage, and their trumpeting cry may frequently be heard, at each utterance of which they raise the tips of their wings towards the head in a very remarkable manner.

[The pair first received are represented in a most characteristic and truthful manner in the folding plate.]

Sir Rutherford Alcock, describing the Daimios' quarter at Yeddo ("The Capital of the Tycoon, &c.," vol. i., p. 131), remarks:

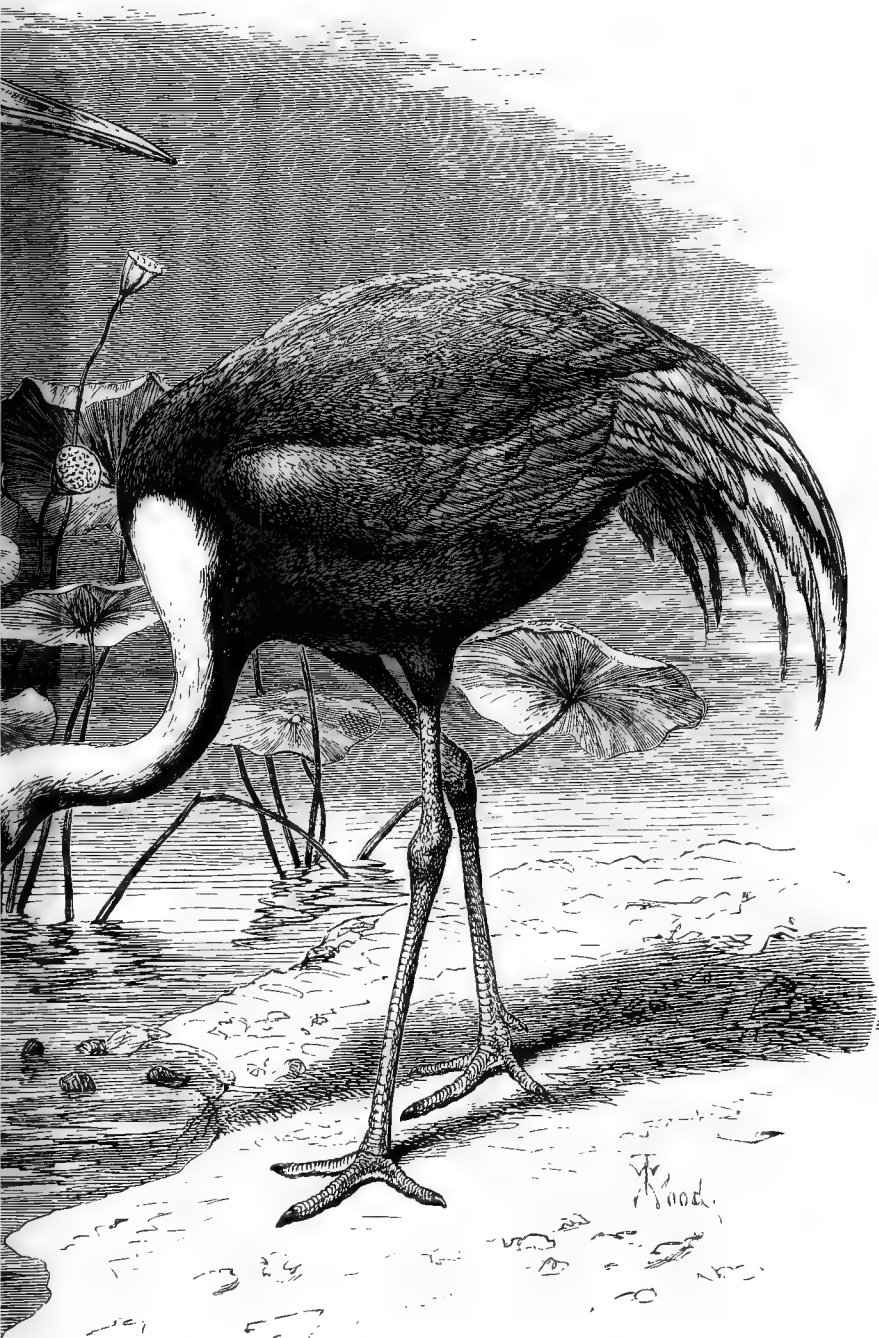
Here are fine open spaces, not less than fifty feet in width, lined on one side with the open buildings and great massive-looking gateways of the Daimios' residences, and those of the high officers in the employment of the government; and on the other by the large deep moats fed by tributary rivers, in which at this season of the year [winter] thousands of wildfowl lie undisturbed. It being death to molest or shoot them, they are so secure that it is almost impossible to get them up; but if for a moment they are startled they rise like a dark cloud from the water, in immense numbers. In the more shallow parts the sacred ibis of Egypt [or rather a kindred species to that of Nubia and Abyssinia, not of Egypt in the wild state] solemnly picks his way and his food, enjoying, as an emblem of happiness and longevity with the Japanese, quite as much sanctity as in the land of the Pharaohs. With the agriculturalists the whole race of storks, cranes, and paddy-birds, of which there are great numbers, are in much favour (partly, no doubt, for their useful qualities); and they may often be seen in twos and threes following the plough with the greatest gravity, close at the heels of the peasant, picking the worms out of the fresh upturned earth and making their morning meal, equally to his advantage and their own.

But Sir Rutherford Alcock misapplies the name of stork to the cranes:

I have already remarked (he writes) on the semi-worship of the stork [meaning the crane] by the Japanese. They are the favourite objects of artistic skill in every



GRUS LEUCAUCHEN (THE



WHITE-NAPED CRANE).

form of ornamentation—in porcelain and lacquer, tapestry and embroidery; and nothing can be more artistic than the way in which they are treated in all these various works : (*Ibid.*, vol. i., p. 307.)

[To illustrate the artistic manner in which the cranes are treated by the Japanese I have inserted some photo-lithographic reproductions of original drawings from Cutler's Grammar of Japanese Ornament.] Elsewhere Sir R. Alcock represents a flock, some on the ground, others in the air : (vol. ii., p. 281.)

Beyond (he writes), on the surface of the pond, are myriads of wildfowl, so conscious of their immunity from gun and dog, under imperial decree, that they allow you to approach within a few yards—a most aggravating sight to a sportsman[P]; but such is the law, and the birds evidently know it. No shot at bird or beast may be fired within ten ri, or thirty miles, of the Tycoon's residence; and Yokohama, alas! is only seventeen miles distant. To the Japanese probably it is no privation; but to an Englishman, sick of pork and fowls all the year round, and eager for open-air sport and exercise, it is very hard; but the Japanese officials seem to take all the more pleasure in vigorously insisting upon the inviolability of the laws. Their artists equally excel, from long and loving study, in depicting all kinds of wildfowl. Hawking seems the only sport in vogue even among the privileged and higher classes, and that in the imperial domain is strictly limited likewise to the Tycoon. No private individual, so I am told, may even keep a falcon, of which there are some very fine specimens. This is only one of the numerous petty restraints and restrictions arising from a totally different state of society and political organisation—of a more or less irritating and vexatious character—to which foreigners must perforce submit who take up their residence in Japan.

[The power of the Daimios is at an end; the restrictions which Sir Rutherford Alcock regarded as so petty and irritating in 1863 have been removed. The result is told us by Messrs. Blakiston and Pryer in their list of the birds of Japan : (*Ibis*, 1878, p. 224.) These gentlemen write as follows :

“*Grus leucauchen*, ‘Tancho,’ the national Crane of Japan. This beautiful bird used to be rather common, but, now that it is permitted to become a prey of any one, has been almost exterminated. It was formerly allowed to be hawked, with great ceremony, only by nobles of the highest rank. This is the crane so commonly figured in native drawings, and is much and deservedly admired. It is a bird of passage.”

Of the migration of this species we know most from Lieut.-Col. Prjevalsky, who in his account of “The Birds of Mongolia, the Tangat Country, and Northern Tibet,” informs us :

About Dalay-nor and the town of Kalgan we met with a few of these cranes, and consequently think that they do not go far into the interior of Asia, although they are common in Ussuri-country and in Manchuria.

About Lake Hanka *G. leucauchen* is more numerous than any other species of this genus, arriving there in the beginning of March, when the snow is still on the ground, and the nights are frosty up to 20° C. The principal migration, however, takes place in the middle of March. Early in April, when the marshes are free from ice, they take up their position in pairs. During the breeding season the male is very much attached to the female, and often gambols before her on the ground, and goes

through all sorts of peculiar evolutions in the air. Sometimes several pairs come together and go through these performances collectively by jumping up, stooping down, flapping their wings, and bending their heads, &c. The first young were taken by me about Hanka on the 19th May. *Rowley's Ornith. Misc.*, vol. ii., p. 436.]

It is remarked by Kämpfer, in his "History of Japan" (an English translation of which was published in 1727), that

Wildfowl, though naturally shy, are in this populous country grown so familiar, that many kinds of them might be ranked among the tame. The tsuri, or crane, is the chief of the wild birds of the country, and hath this particular imperial privilege, that nobody may shoot him without an express order from the emperor, and only for the emperor's own pleasure or use. In Saikokf, however, and other provinces remote from court, a less strict regard is had to the like imperial commands. The cranes and tortoises are reckoned very happy animals in themselves, and thought to portend good luck to others, and this by reason of their pretended [?] long and fabulous life, of which there are several remarkable instances in their historical writings. For this reason the imperial apartments, walls of temples, and other happy places are commonly adorned with figures of them, as also with figures of firs and bamboos for the like reason. I never heard country people and carriers call this bird otherwise than *O Tsurisama*, that is, "my great lord crane." There are two different kinds, one white as snow, the other grey or ash-coloured.

Three other species are as equally well known in Japan as the White-naped crane, namely, *G. leucogeranus*, *G. communis*, and *G. monachus*.

In the species which follow the tertiaries are broad, and are somewhat curved, but are not elongated or drooping, though they are arched to some extent, and more or less so according to the species.

GRUS LEUCOGERANUS (PALL.).

ASIATIC WHITE CRANE.

GRUS LEUCOGERANUS, Pall. Reise Russ. Reich., vol. ii., p. 438 et Anhang, p. 714, Tab. 41. (1773.)

ARDEA GIGANTEA, S. G. Gmel. Reise durch Russl., vol. ii., p. 189. (1774.)

GRUS GIGANTEA, Vieill. Nouv. Dict., vol. xiii., p. 558. (1817.)

GRUS LEUCOGERANA, Temm. & Schl. Fauna Jap., p. 118. (1850.)

GRUS LEUCOGERANUS, Temm. & Sch. op. cit., pl. 73. (1850.) (Young.)

ANTIGONE LEUCOGERANUS, Reichenb. Syst. Av., pls. 214, 217. (1852.)

LEUCOGERANUS GIGANTEUS, Bp. Cat. Parzud., p. 9. (1856.)

Although so long ago described, and universally admitted as a species on the authority of Pallas and others, very little was satisfactorily known





C. F. Kell Photo-Japan, London, E. C.

DRAWINGS OF CRANES FROM T. W. CUTLER'S GRAMMAR OF JAPANESE ORNAMENT.

respecting this superb crane until Mr. A. O. Hume, of the Bengal Civil Service, published his elaborate and very excellent description of it in the *Ibis* for 1868 (pp. 28—40); and we first learn from that observer that it differs remarkably from all the other species of restricted *Grus* (as distinguished from *Balearica*) in its trachea not being prolonged to enter a cavity in the keel of the breast-bone. In that of a fine male, he remarks, “instead of a convolution entering and running far back into the sternum, there is merely a somewhat dilated bend just where the windpipe enters the cavity of the body; and it is only after the pipe has divided, which it does symmetrically into two very nearly equal tubes, about 3in. before entering the lungs, that the rings are at all strongly marked, or that the tube impresses one as being at all powerful.” * * *

“When not alarmed, the White Crane’s note is what, for so large a bird, may be called a mere chirrup; and even when most alarmed, and circling and soaring widely round and round, looking down upon the capture of a wounded offspring or partner, their cry (a mere repetition of the syllables *karekhur*) is very feeble as compared with that of any other of the cranes (including even *Balearica pavonina*) whose notes I have myself ever heard.”

In the *Ibis* for 1869, p. 237, Mr. W. E. Brooks remarks that :

With regard to the notes of *Grus leucogeranus*, how the natives can imagine that their name *karekhur*, or as I shall call it, *care-cur*, expresses any one of them, I cannot conceive. The notes are all simple whistles, from a mellow one to a peculiar feeble shrill shivering whistle, if I may so express it. No written word will express the note of this species, nor give the faintest idea of it. I watched a flock of these fine birds for some time yesterday, as they fed in a marsh in company with about a dozen of *G. antigone* and three of *G. communis*. I found it impossible to get within shot of the white cranes, nor could I get them driven over to me as I sat in ambush, for as soon as they take wing they immediately begin to soar, and circle round and round till they attain a height far above the reach of any shot; they then fly straight away, uttering their peculiar whistle, which, though weak as compared with the call of other cranes, can still be heard a mile off or even more. It is a magnificent bird, and, I think, the most graceful of the group in its attitudes. The species is abundant, being found in large flocks (near Etawah), and the eggs might be obtained from Russian sources. The plumage is so very compact and swan-like, that it must go very far north to breed, where perhaps its snowy plumage harmonises with the still unmelted snow as it sits upon its nest.

Mr. Hume remarks that the aliment of the species would appear to differ from that of all other cranes in being exclusively vegetable. Pallas, however, states that it feeds upon small fish, frogs, and lizards, which there can be little doubt that it does to some extent at least.

This much premised, the Asiatic White Crane would appear to stand from 4ft. to 4½ft. high at the crown when standing erect, the males being larger than the females, and the extremes varying considerably. Mr. Hume gives the “whole length of the males as ranging from 52in. to 56in., and of the females as 48in. to 53in. Expanse of wings in the male sex 90in. to

100in., in the female 83in. to 92in. A living adult from India, exhibited some time ago in the Zoological Gardens, was quite a small bird in comparison with the stuffed specimen in the British Museum (all due allowances being made of course). Mr. Hume remarks that "the males are considerably larger than the females, the adults of the former weighing up to 19lb., but of the latter only—as far as my experience goes—to about 16lb. Of the young birds, however, when they first arrive, the males do not exceed about 10lb. in weight, and the females 9lb., though generally very fat and well cared for by the parents. When we first see them they cannot, as I estimate, be more than six months old; . . . for they can scarcely hatch off before May." I cannot do better than quote—or rather do my best to compress—from Mr. Hume in further detail.

The plumage, as a whole, is of a most brilliant white; but the primaries and their greater coverts are black, above which the lesser coverts are white, while above these again the winglet also is black. . . . The forehead, lores, and cheeks are naked, of a dull reddish hue, pretty thickly set with short yellowish hairs. In some old birds the hindmost of these hairs, just where they meet the white feathers, are longer and thicker than elsewhere, and of a brownish hue, thus producing the appearance of a narrow brown line, dividing the snowy feathers from the bare red space. The ear orifices are very broad and oval, reminding one of those of the owls and other birds of prey. The bill is umber brown, very smooth and polished. . . . The legs and feet are of a dull reddish pink, varying to dull red, somewhat brighter on the feet. . . . The irides are a bright, very pale yellow; the colour does not vary with age; but in some birds the iris is almost silvery, and in others there is a pinkish tinge. In the young there is no bare space about the face. The whole head and upper part of the neck are of a somewhat rusty buff. The space destined to become bare, however, is, in the youngest specimens that I have seen, well defined, its clothing feathers being of a browner and dingier hue than those of the rest of the head, and sitting much closer to the skin. The buff is clearest and deepest on the cheeks and the top and back of the head, and very pale on the chin and throat. The rest of the plumage, when first we see the young birds, may (excepting the primaries and the greater coverts and the winglets) be described as buff, in some places brighter and more rufous, in others duller and sandier, with white everywhere beginning to peep through it. In February, though still much varied by buff, the white predominates in the body plumage. . . . By the end of March, when the birds are nine or ten months old, the face has begun to grow bare, and though there is still some buff in the parts above mentioned, it has become markedly less in extent, and duller in tint.

I ought not to omit to notice that out of more than twenty specimens of the White Crane that I have procured (between October and the middle of March), none had the tertials at all particularly elongated, and in no instance did these, when the wings were closed, exceed the tail-feathers or longest primaries (which usually reach just to the end of the tail) by more than three inches. . . . The feathers of the hind head and nape are somewhat lengthened, so as to form a full and broad though short subcrest, very noticeable when a wounded bird is defending itself against dogs and other assailants. It is a brave bird, and fights to the last, striking out powerfully at times with bill, legs, and wings, but most generally defending itself chiefly with its bill, with which it inflicts occasionally almost serious wounds.

In Mr. Gould's figure of this species in his "Birds of Europe," plate 271, and again in Dr. Bree's copy of that figure in the "Birds of Europe not

Observed in the British Isles," some elongated and pointed breast feathers are represented, such as do exist in *Grus paradisea*; but there is not a trace of them in *G. leucogeranus*. In these figures the bill as well as the forehead are also erroneously represented of a bright yellow.

Mr. Hume's entire account of this bird is too long for citation in full, but there is no better to quote from, so that we must needs have further recourse to it. "Sixteen years," he wrote in 1867, "have now elapsed since first I shot one in Ladakh (in the Himalaya). This was in October; and the birds were doubtless then on their way to India. . . . Years passed away, and I never once met with a single specimen. Soon after the mutiny, however, in 1859, I succeeded in shooting one out of a flock of some five-and-twenty, which I found in a large jheel or shallow rain-water lake, about half-way between Agra and Cawnpore. During the winters of 1865-6 and 1866-7 I procured and preserved a number of specimens in the same neighbourhood, and have had many opportunities of watching them pretty closely."

They are very probably to be found during the cold weather in suitable localities throughout the plains of the north of India; but the only place where I have observed them, out of the Himalaya, is in a tract of country lying to the north of the Etawah, and south of the Mynpooree districts, in the middle of the Duâb, or Mesopotamia, of the Ganges and Jumna, and, as I said before, about half-way between Agra and Cawnpore. That they themselves are rare, and that localities suited to their tastes are not numerous, may be inferred from the fact that, apparently, Dr. Jerdon, when he published his work, had never seen one; while, as far as I know, until I last year sent a pair to Madras, there were no specimens in any of our [Indian] museums. The locality in which, during these last two winters, I have seen and procured, comparatively, so many of these beautiful birds is somewhat peculiar. A broad straggling belt of *dhak* (*Butea frondosa*) jungle, some ten miles in width—at one time doubtless continuous, but now much encroached upon, and intersected in many places by cultivated lands—runs down through nearly the whole of the Duâb, marking, I suspect, an ancient river course. Just where the northern and southern boundaries of the Etawah and Mynpooree districts lie within this belt, the latter incloses a number of large shallow ponds or lakes ("jheels" as we here term them), which, covering from two hundred acres to many square miles of country each at the close of the rainy season, are many of them still somewhat imposing sheets of water early in January, and some few of them of considerable extent even as late as the commencement of March. . . . Many of them abound with rushes and sedges, and as the waters gradually dry up, or are drawn off for irrigating purposes, become successively the favourite haunts of the White Crane.

There will always be at any particular time two or three "jheels" that for the moment they particularly affect, and these are, as a rule, just those that then happen to average about 18in. to 2ft. in depth, and that have a great deal of rush (*Scirpus carinatus* amongst others) somewhere in the shallower parts.

To this tract of country they make their way as early as the 25th October (and possibly sooner, though this is the earliest date on which I have observed them); and there they remain at least as late as the end of March, or perhaps a week or two longer. During the whole of our cold season they stay in this neighbourhood, and, though growing more and more wary (if possible) each time they are fired at, and disappearing for a day or two from any jheel where an attempt has been made to kill or capture them,

they never seem to forsake the locality until the change of temperature warns them to retreat to their cool northern homes. Week after week I have noticed, and repeatedly fired at, sometimes even slightly wounded, particular birds, which have nevertheless remained about the place their full time; nay, I have twice now killed the young birds early in the season, and the parents, one by one, at intervals of nearly a couple of months.

The Buhelias, a native caste of fowlers (and, I fear I must add, thieves), of whom there are many in the neighbourhood, and who are keen observers of all wild animals, assure me that, as far back as any of them can remember (namely, for at least the last fifty years), parties of the White Crane, or as they call them *karekhurs*, have been in the habit of yearly spending their winters in the same locality. Though occasionally in larger flocks, it is usual to find either a pair of old ones accompanied by a single young one or small parties of five or six, which then, as far as I can judge, consist exclusively of birds of the second year. The fully adult birds are, even when they first arrive, of a snowy whiteness; and each pair is almost without exception accompanied by a single young one, which when first seen is of a sandy or buff tint throughout, and very noticeably smaller than its parents. They never appear to have more than one young one with them; but it does not at all follow that they do not lay more than one egg. Our commonest Indian crane, which usually lays two and sometimes, though rarely, three eggs, and which has no long or arduous journey to perform, seldom succeeds in rearing more than a single young one. Judging from those of its congeners which are best known to me—*G. antigone* and *G. australasianus*—as also of what is recorded of the Common and Demoiselle Cranes (whose nests I have never myself taken), I should suppose that they lay two eggs; but, if this be the case, I can only say that out of more than a hundred pairs that I have seen from first to last, I never yet saw any with more than one young one.

The watchful care and tender solicitude evinced by the old birds for their only chick is most noticeable. They never suffer the young one to stray from their side, and, while they themselves are seldom more than thirty yards apart, and generally much closer, the young, I think, is invariably somewhere between them. If either bird find a particularly promising rush-tuft, it will call the little one to its side by a faint creaking cry, and watch it eating, every now and then affectionately running its long bill through the young one's feathers. If, as sometimes happens, the young only be shot, the old birds, though rising in the air with many cries, will not leave the place, but for hours after keep circling round and round high out of gun—or even rifle—shot, and for many days afterwards will return, apparently disconsolately, seeking their lost treasure.

Like the Sárás, these birds pair, I think, for life; at any rate, a pair, whose young one was shot last year, and both of whom were subsequently wounded about the legs, so as to make them very recognisable, appeared again this year, accompanied by a young one, and were at once noticed as being our very friends of the past year by both the native fowlers and myself. I was glad to see they were none the worse for their swollen, crooked, bandy legs; and this year at least they have got safe home, I hope, with their precious charge.

Throughout their sojourn here the young remain as closely attached to their parents as when they first arrive; but, doubtless by the time the party return to their northern homes, the young are dismissed, with a blessing, to shift for themselves. Long before they leave, the rich buff or sandy colour of the young birds has begun to give place to the white of the adult plumage, and the faces and foreheads, which (as in the Common Crane) are feathered in the young, have begun to grow bare. This, I notice, seems to result from the barbs composing the vanes of the tiny feathers falling off and leaving only the naked hair-like shafts.

Each year small parties of birds are noticeable unaccompanied by any young ones, and never separating into pairs. These, when they first come, still show a few buff

feathers, and have a dingy patch on the tarsus; and though before they leave us they become almost as purely white, and have almost as well-coloured faces and legs as the old ones that are in pairs, they never seem to attain to the full weight of these latter. From these facts I am disposed to infer that these parties, which include individuals of both sexes, consist of birds of the second year, that our birds do not either breed or assume their perfect plumage till just at the close of the second year, and that, like pigeons and many others, they do not attain their full weight until they have bred once at least.

Unlike the four other species of crane with which I am acquainted, *G. leucogeranus* never seems to resort, during any part of the day or night, to dry plains or fields in which to feed; and, unlike them too, it is exclusively a vegetable-eater. I have never found the slightest traces of insects or reptiles (so common in those of the other species) in any of the twenty odd stomachs of these White Cranes that I have myself examined. Day and night they are to be seen, if undisturbed, standing in the shallow water. Asleep, they rest on one leg, with the head and neck somehow nestled into the back; or they will stand like marble statues, contemplating the water with curved necks, not a little resembling some White Egret on a gigantic scale; or, again, we see them marching to and fro, slowly and gracefully, feeding among the low rushes. Other cranes, and notably the common one and the Demoiselle, daily pay visits in large numbers to our fields, where they commit great havoc, devouring grain of all descriptions, flower shoots, and even some kinds of vegetables. The White Crane, however, seeks no such dainties, but finds its frugal food—rush seeds, bulbs, corms, and even leaves of various aquatic plants—in the cool waters where it spends its whole time. Without preparations by me for comparison, I hardly like to be too positive on this score; but I am impressed with the idea that the stomach in this species is much less muscular than in any of the others with which I am acquainted. The enormous number of small pebbles that their stomachs contain is remarkable. Out of an old male I took sufficient very nearly to fill an ordinary-sized wineglass, and that, too, after they had been thoroughly cleaned and freed from the macerated vegetable matter which clung to them. These pebbles were mostly quartz (amorphous and crystalline), greenstone, and some kind of porphyritic rock; the largest scarcely exceeded in size an ordinary pea, while the majority were not bigger than large pins' heads. Perhaps, in the hands of some abler mineralogist than myself, these tiny fragments (of which I have a small bag full) may prove to contain as yet unnoticed mineral forms from Central Asia. I have found similar pebbles in the stomachs of the Grey and Demoiselle Cranes, but never in anything like such numbers as in those of the present species. When shot, the White Cranes are worth nothing as food, which, considering their diet here, is not surprising.

Mr. Hume remarks that, in the instance of the cranes, the Hindu names in use in his portion of Northern India clearly owe their origin to the cries of the several birds. Thus *Grus communis* is called *kooroonch*, or *koonch*; *G. virgo*, *kurrikurra*, and *G. leucogeranus*, *karekhur*; “each of these names, when pronounced by a native, being an appreciable imitation of the cry of the particular species it seems to designate.”

According to Pallas, the Asiatic White Crane is observed throughout the whole of Siberia, being also found in Dauria, in China, and Japan. And Swinhoe found it in North China, Amoorland, and Japan. It inhabits in summer the vast morasses of Siberia, and every part where lakes abound, penetrating far north into the boggy forests about the Ischin, Irtisch, and Oby.

[Mr. H. Seebohm, in his Notes on the Ornithology of Siberia (*Ibis*, 1879, p. 149), writes, "A small flock of four or five of these handsome birds flew leisurely over our steamer as we were threading the labyrinths of the Too'-ra. During flight they appeared to be pure white all over, except the outside half of each wing, which looked jet-black.]"

Its nest is made among almost inaccessible reeds, with layers of plants. The eggs are two in number, grey, streaked with numerous dusky lines. This bird winters usually about the Caspian Sea, and is observed to migrate in spring northward, along the course of the Volga, always in pairs. Nordmann also remarks that it is common south of the Volga, and on the western shores of the Caspian Sea. He also states that two individuals were seen by Pallas in April in the neighbourhood of St. Petersburg. In "A List of the Birds observed to winter in Macedonia," by Col. Drummond Hay (then Captain H. M. Drummond), published in the *Annals and Magazine of Natural History*, vol. xviii. (1846), pp. 10 *et seqq.*, that observer remarks that "a large flock of these very rare birds [*i.e.*, as occurring in Europe] were seen on January 9; when on the wing they made a hissing noise; I, unfortunately, was unable to obtain a specimen." Sir Alexander Burns procured examples in Afghánistán, and excellent figures of those specimens, drawn under his superintendence, are now in the library of the Asiatic Society of Bengal. Major L. Howard Irby, in some "Notes on Birds observed in Oudh and Kumaon," published in the *Ibis* for 1861, states that, "Though I never succeeded in obtaining a specimen of this crane, I saw it on four different occasions: at Sander in February, and at Hilgee on the river Choka, in December, 1859. The first time there were three together, two white and one dusky coloured (the colour of an immature hooper swan) —no doubt the two old birds and their young. I tried to get a shot at them in vain, they were so excessively wild, which is not the case with the Sárás; though the Common and Demoiselle Cranes are in India very difficult to approach, the only way of shooting them being with a rifle." According to Père David this species breeds in the province of Leautung, or Leaotong, which lies immediately north of the Yellow Sea, and borders on the Corea to the east and south-east of it.

[I may add that, in addition to the plates already mentioned, the species is figured by Temminck, pl. col. 467, and the young in *Fauna Japonica*, pl. 73. A head drawn from a living specimen in the Zoological Gardens is now given in plate 1, fig. 2.]

In the next three species there is a bald and smooth greyish *pileus* or coronal shield, which contrasts abruptly with the red and papillose skin of the occiput, and the tertiaries are curved and but slightly elongated, the

uppermost of them being a little discomposed. In their habits they do not tend much to be gregarious nor migratory, nor do they feed so much on grain as do the cranes of the *G. communis* section. In fact, the occasional flocks of them would appear to consist of unmated birds of the preceding season, as in *G. leucogeranus*. In the two of them which inhabit India the nude papillose skin is much more developed than in any other, extending over about a fourth of the neck.

All three have been confounded under the specific name *antigone*. It is probable that the following remark of Professor Huxley is of generic application to most, if not all, of the species which I here associate as constituting the Sárás sub-group. In his remarks on the classification of birds (*Pr. Zool. Soc.*, 1867, p. 430) it is stated that "the cranes almost always lack the basipterygoid processes and the corresponding facets upon the pterygoids, the only exceptions I have met with being *Grus antigone*."

GRUS COLLARIS (Bodd.).

THE COLLARED CRANE.

GRUS COLLARIS, Bodd. Tab. des Planches Enlumin., p. 52. (1773.)

GRUE À COLLIER, Buff. Pl. Enlum., pl. 865. (1783.)

GRUS TORQUATA, Viell. Gal. des Ois., vol. ii., p. 142, pl. 256. (1834.)

ANTIGONE TORQUATA, Reich. Syst. Avium., p. XXIII.

[Mr. Blyth described this species under the name of *Grus torquata*, Viell., but Mr. P. L. Scater writes :

I agree with Mr. Blyth that this is probably a good and distinct species, though nearly allied to *Grus antigone*. There were five living specimens in the Amsterdam Gardens in the year 1877, but we have not had it represented in the Regent's Park. If the *Grue à collier* of the Planches Enluminées (No. 865) is intended for it, it should bear the name *Grus collaris*, Boddaert.]

This is the Sárás crane of Upper India, Bengal, Assam, and Burma. It is larger and stands proportionately higher on the legs than the others, from which it is further distinguished by its broad and pure white nuchal ring, and by its albescent, almost pure white, tertiaries. Jerdon, confounding it with that inhabiting the peninsula of India, remarks that "at the breeding season in the month of April they assume a pure white collar immediately below the crimson papillose skin of the neck, which also becomes brighter in colour," &c. ; but no species of crane undergoes a seasonal change of colour of this kind, and an example of the following species (which is the

Sárás crane of the Peninsula of India), at this time in the Zoological Gardens, Regent's Park, has not put forth the white nuchal ring during the breeding season, while the more northern species retains it at all seasons. There are several good mounted specimens of *G. torquata* in the ornithological gallery of the British Museum, but no living example in the Regent's Park menagerie.

There has been so much confusion as regards the species of this particular group of cranes, that it is impossible upon present data to trace the geographical distribution of either one of them, the Australian "native companion" alone excepted. In the trans-Baikal countries the species is the *G. leucauchen* of Temminck; and in Australia the *G. australis* is the *antigone* of the older catalogues. In India and Burma further observation is needed, now that it is shown that two species have been confounded under the name *antigone*. In Bengal I have only seen the *G. torquata*, and I am satisfied that the following description given by my friend Major L. Howard Kirby (*Ibis*, 1861, p. 242) refers to it. Major Irby's paper is entitled "Notes on Birds observed in Oudh and Kemaon."

Found in great numbers in the cold season, generally in pairs, though sometimes in flocks, whereas the Common and Demoiselle Cranes are always seen in flocks. Many Sárás remain to breed in Oudh, forming an immense nest of grass and rushes in the centre of large jheels. The number of eggs which are laid in June is generally two; some eggs are pure white, others white (or rather bluish white) spotted with red at the larger end. The young birds are easily reared by hand, and become very tame and attached to the person who feeds them, following him like a dog. They are very amusing birds, going through the most grotesque dances and antics, and are well worth keeping in captivity. One which I kept, when bread and milk was given to him, would take the bread out of the milk, and wash it in his pan of water before eating it. This bird, which was taken out of the King's palace at Lucknow, was very fierce towards strangers and dogs, especially if they were afraid of him. He was very noisy—the only bad habit he possessed. The natives say that if a Sárás be killed, its mate will never pair again [P]; certainly I have heard the survivor calling all night for its mate, and since then I never would shoot them. The flesh somewhat resembles that of a goose; it makes capital soup, and the liver is considered rather a delicacy by some people.

[The species is not named by Latham, Index No. 4, a reference given by Vieillot, who gives the following description and a bad coloured plate: La Grue à collier, *Grus torquata*. Cette grue qu'on trouve aux Indes orientales, a la haut du cou orné d'un collier rouge, bordé de brun dans la partie inferieure; la tete nue et d'un gris rougeâtre; les pennes des ailes, celles de la queue noires, le reste du plumage d'un gris bleuâtre; le bec noir; les pieds noirâtres. Longueur totale, four pieds three pouces.—Vieillot *Gal. des Oiseaux*, vol. ii., p. 142.]

GRUS ANTIGONE (LINN.).

GRUS ORIENTALIS INDICA, Briss. Ornith., vol. v., p. 378. (1760.)

ARDEA ANTIGONE, Linn. Sys. Nat., p. 235. (1766.)

GRUS ANTIGONE, Pall. Zoogr. Rosso-As., vol. ii., p. 102. (1811.)

GREATER INDIAN CRANE, Edwards, Nat. Hist., vol. i., pl. 45. (1743.)

SARAS OR SYRUS CRANE of the English in India.

In size, colouring, and proportions the Sárás crane closely resembles the “native companion” of Australia, but is at once distinguished from all except *G. collaris* by the much greater development of the nude skin, which extends for some distance down the neck. Jerdon, who confounded this species with the last, thus describes it:

Head and neck naked, and covered for three or four inches with numerous crimson papillæ, clad with a few scant black hairs, which accumulate into a level ring on the neck, and form a sort of mane down the nape of the neck; ear-coverts white (or rather pale grey); below this the neck is whitish grey, which gradually passes into the pale blue or French grey, which is the colour of the whole plumage; the quills and the inner webs of the tail feathers being dusky slaty; bill pale sea green, brownish at the tip; irides orange red; legs and feet pale rosy red; length about 52in.; extent nearly 8ft.; wing 26in.; tail 9½in.; bill at front 6½in.; tarsus 12½in. to 13in.; weight 17lb. or 18lb.

I am by no means sure that the foregoing dimensions are not rather those of *G. collaris*. The two are decidedly confounded in the following notice of the geographical distribution of what were supposed by Dr. Jerdon to constitute a single species:

The Sárás is found throughout the greater part of India and Burma, is rare south of the Godavery, and also apparently in the Pánjâb, for Adams states that he did not see it there; but common in Central India, Bengal, and parts of the north-west provinces (*i.e.* *G. collaris*), and still more so in Candeish. It is chiefly found in pairs, occasionally several together.

It feeds less exclusively perhaps on grain than the other cranes met with in India, and is very generally found not far from water. It breeds on some island or spot nearly surrounded by water, laying two eggs only, of a very pale bluish green colour, with a few reddish spots. The nest is sometimes commenced below water, and is raised some inches above the surface. The young have the head and neck dull ferruginous (so far down as the naked skin extends in the adult). The old birds, when sitting or with their young, are very bold, facing an intruder, be it boy or man, lowering their head, and spreading out their large wings in a most formidable-looking manner. Its fine trumpet-like call, altered when alarmed or on the wing, can be heard a couple of miles off. A young Sárás is not bad eating, but old birds are worthless for the table. Some epicures assert the liver to be peculiarly fine. In most parts of the country it is so confiding and fearless in its habits as to preclude the sportsman from shooting it, and in the territories of Holkar it is, if not venerated, esteemed so highly as to be held sacred from the *shikâris*, and I have known complaints made against officers for shooting them.

It is not likely that there should be any perceptible difference of habit between species so very nearly akin as are the two Sárás Cranes of India.

I suspect, as before remarked, that the flocks of them referred to consist of yearling birds as yet unpaired, like those of *G. leucogeranus*.

[The following description of this species from the notes of the late Col. Tickell is the most complete with which I am acquainted, and I therefore have much pleasure in quoting it to supplement Mr. Blyth's somewhat short account: I have also given a figure of the head of this species (pl. 1, fig. 3), drawn from a specimen living in the Zoological Gardens, Regent's Park.—W. B. T.]

Head, and neck for a short space from thence, bare and papillous; crown smooth; nape, throat, and a collar round the bare neck covered with small fine wool; a patch of short feathers over each ear.

Length of a male bird, 4ft. 8½in.; spread, 8ft. 2in.; wing, 2ft. 7in.; tail, 10in.; bill, 6½in.; tibia, 1ft. 3¼in.; tarsus, 1ft. 1in.; middle toe, 5in.; neck, 2ft.; weight, 19½lb. Female, 4ft. 4in. in length; spread, 7ft. 6½in.; and the rest in proportion.

Iris orange; bill pale greenish, horny, with dark tips; skin on crown, pale ashy green; papillous skin of head and neck orange-red, shaded darker here and there, and furnished with a scanty black wool. At the bottom of the neck, bordering the plumage, is a collar-like space of bright orange skin. Entire plumage pale bluish ash (as are the ear patches or auriculars); ends of tertials almost white; secondaries and primaries black or blackish iron-grey; legs reddish or flesh-colour. The female has less of the naked space on the neck.

The young are at first covered with a brown down, which gets lighter till, in about six months, the wool is covered by the plumage, which is at first dull and brownish grey. It is only in quite old specimens that the grey hue is clear and unstained.

This noble bird, though agreeing exactly with the common crane in outward details, is so dissimilar in habits that by some authors it is placed in a genus of its own, *Antigone* (Reichenbach). It is found in most parts of India, except the extreme north and south. In the Punjab it is said to be exceeding rare. Adams (an old writer) denies its existence in that quarter. It is not by any means common in the valley of the Ganges, but prefers the uplands, off the alluvium, and in the neighbourhood of forest. In the Tenasserim provinces, and in Arracan, it is well known; and in Chota Nagpore, Western Bengal, and Singbhoon, exceedingly common. I do not remember having met with it anywhere on the left bank of the Ganges (Chuppra, Tirhoot, or Poornia).

It prefers meadows, either marshy or upland—not too marshy, for it eschews water and will not wade—and is fond of grazing near the skirts of jungle, especially in the stubble of the paddy fields, which the Koles, Sontals, Bhoomijes, and such wild people in Bengal cultivate in the forests. In such spots this bird is often seen early in the morning, or near sunset, generally in pairs, or attended by a solitary young one; and the loud trumpet-like call of the male often directs the passenger's attention over the far plain to where he stands like a beacon, watching, or hailing some other distant pair, while his mate and long-legged chick are grazing close by. The sarrus, never being molested by the natives, is generally pretty tame, and allows sufficiently near approach to watch its graceful and dignified movements. Should the spectator draw too near, the birds walk off, with long strides and erect necks, turning their heads from side to side to stare at the intruder. If still pursued, they break into a short, awkward run, lean forward, and, spreading their broad sail-like wings, betake themselves to flight, proceeding with heavy, flagging strokes very near the ground, and calling to each other in loud clarion notes, which resound afar. Their flight rarely exceeds half or three-quarters of a mile in length, or about twenty feet from the ground in height. They cannot run, but walk for a short distance fast enough to keep a human being on a jog

trot. I remember once seeing a tame sarrus striding after a little native boy, who was filling the air with shrieks, and running as fast as his little drumsticks would let him—unable, however, to avoid the *à posteriori* propulsion of the bird's bill.

The sarrus, unlike other cranes, is a perennial resident in India. They begin to breed in May, and a more singular sight than their courtship is rarely to be witnessed. The pair meet generally in a wide open plain, and commence the marriage ceremony with a kind of minuet, the male taking the lead, and being followed by the female in a series of fantastic postures, bending with the heels almost touching the ground, then jumping suddenly up, putting forth one wing, and then the other, and then turning round with both extended, performing a *dos-à-dos* movement, and again meeting and ambling round each other with feet lifted on high. The desired congressus winds up this extraordinary dance, and then the happy pair commence grazing as if nothing had happened. I have often laughed heartily, and seen others do so, at this comical spectacle; but the simple Lurka Koles of Singbhoom (where these birds are very common), so far from seeing anything ridiculous in these antics, looked upon them as the acme of graceful love-making; and the most amusing part of the exhibition used to be the hearing their remarks of unmixed admiration at the most ludicrous parts of the scene. The nest of this bird I have never seen, but was told by the country people in Singbhoom that it is constructed of layers of grass, placed on the ground in marshy, reedy places at the bottom of a hill, or in a narrow valley covered and surrounded by jungle. Jerdon says it breeds on some island or spot nearly surrounded by water, and that the nest is sometimes made in the water, and raised some inches above the surface. This is very singular, if true, for of hundreds of these birds I have watched, and many I have kept tame, I have never seen one individual wade. The female sits a-straddle on the nest to hatch the eggs, and is assiduously tended by the male, who takes his turn in the office of incubation. The eggs are almost invariably two in number, somewhat slender, oviform in shape, and of a dull yellowish white, sprinkled with small patches or drops of very pale brown, most thickly scattered over the big end. In some the brown marks are almost entirely absent, and the shell is thickly beset with porous indentations. The average size of the egg of the male chick is 4 in., and 2½ in. across; of the female 3½ in. by 2½ in. The young, at first covered with brown woolly down, cannot stand readily for a few days after birth, but remain seated or kneeling on their heels. The size of the chick, in comparison to the shell it has quitted, has always been to me inexplicable. I have certainly never seen one immediately after hatching; but they have been brought to me while yet unable to stand—that is, when not more than five or six days old, and they have then measured nearly two feet from the crown to the ground. The growth, therefore, of the pullus after birth must be rapid beyond conception, for nothing approaching such dimensions could be contained in the egg. It is further remarked that, although the nest almost invariably contain two eggs, it is very rare to see more than one young bird following its parents. And a prettier sight than the family trio is seldom seen—the old birds gravely striding about, with the little one between learning to peck and graze. But ashamed am I to say I was once a *particeps criminis* in breaking up such a family circle. It must, however, be pleaded we were young (I and my chum)—we were “griffs,” and therefore supposed by the time-honoured Quihy to be but partly responsible for foolish acts. We had toiled far that day and procured little for the bag, and we had heard that a sarrus made capital soup, so that coming close upon a trio just as we were about to emerge from the jungle, and each of us selecting an old bird, we fired and dropped them both; but our joy and eagerness to secure the prize was checked and damped by the sight of the poor young one left standing so piteously between the bodies of papa and mamma, and looking so wistfully from one to the other. Poor little orphan! It was easily caught and brought home to camp, and reared tenderly, for the sake at first, perhaps, of the old birds so ruthlessly slain, and then because it became of itself a great favourite, stalking about

the mess tent utterly fearless of dog or man, and having the *entrées* at all meal hours to the crumbs that fell from the well-spread table.

The Sarrus is monogamous, and the pair, once united, separate no more till death them do part. Such, indeed, is the affection and constancy of these noble birds to each other, as well as towards their young, that throughout India it is considered by both Hindoos and Mahomedans almost a crime to destroy them; and, indeed, I doubt whether an English sportsman, even of the most unsentimental kind, after killing one of a pair, or of the little family group, would have the heart ever to repeat the experiment, so grievous are the cries raised by the unhappy survivors. On one occasion at Keyra, in Singbhoom, one of my party having shot a female near the camp, I was distressed throughout the night by hearing the wailing trumpet tones of the bereaved male, fruitlessly calling for the dead; and that night I mentally resolved never, as far as in me lay, to dissolve, or allow to be dissolved, the partnership of these gentle birds again.

The young sarrus is easily tamed, and soon becomes troublesomely familiar. In lieu of the loud clanging cry of the adult, it has a querulous whistling note, a kind of long *trill*, which when expecting food it is constantly repeating. As it grows up it becomes rather an inconvenient pet, pecking children and gobbling up young ducks and chickens. In confinement it eats almost anything, and in its wild state frogs, reptiles, worms, locusts, grubs, rice and wheat when in the ear, and the tender shoots of grasses. A young bird is excellent eating, tender and juicy, and the egg a great delicacy, one being as much as a hearty breakfast-eater can dispose of.

The vernacular names of this species are stated by Col. Tickell as follows: It is the "Sarrus" or "Surhuns" of the Hindustanians, "Gyogya" of the Burmese, "Hoor" of the Lurka Koles of Singbhoom, "Kréo" of the Talaings, and "Akroo" of the Karéns. By the English in India it is indifferently termed Syrus, Sarrus, or Sárás Crane.

Subsequently to the publication of Mr. Blyth's definition of the two species of Sárás crane Col. Tickell stated:

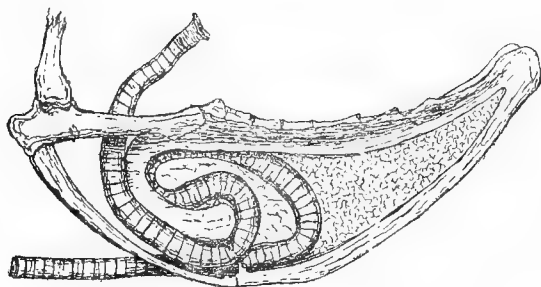
I have been much interested in Blyth's paper on the different species of the Sarrus group of *Gruideæ*, especially as the fact of there being two species in India, as alleged by him—viz., *G. collaris* and *G. antigone*—is quite new to me, and, I suspect, to most if not all of those who have given the ornithology of that country their attention.

The oversight has been caused probably by the repugnance which is usually felt to destroy these great harmless birds, which are generally seen in couples striding about the fields in faithful companionship, not to be severed without the distressing lamentations of the survivor. It is easy, therefore, to understand that two species might exist and be equally common, and yet might be taken for one, the difference between them being too small to be perceived at a distance.

Nevertheless, it is singular that a Sarrus with a "white nuchal collar" has never yet, to my knowledge, been described as existing in India. I have closely examined sarruses dead and alive, in various parts of India—on the Nepal frontier, in Tirhoot, near Patna, Bhagulpoor, Rajmahal, Malda, Bankoora, Chota Nagpoor, Singbhoom, and near Sumbhulpoor, also in Arakan and Tenasserim—and never met with an individual with a white collar.

Jerdon gives it a "whitish-grey" neck below the "white" auriculars, and makes no mention of the smooth nude pale orange collar intervening between the crimson papillous skin of the face and throat, and the feathered part of the neck. So that if Jerdon describes it correctly (as Blyth states), he refers to a sarrus different to any I have seen. Have we then three species in India?

The convolutions of the trachea are developed to a greater extent in this species than in that of the Stanley crane figured at page 22. The subjoined figure shows the trachea of an adult male, one side of the keel of the sternum having been cut away. The preparation and drawing were made by myself from a bird that died in the Zoological Gardens in 1879. As the individual was perfectly matured, it is probable that the specimen shows as great a degree of convolution as occurs in this species.—W. B. T.]



STERNUM AND TRACHEA OF GRUS ANTIGONE.

GRUS AUSTRALASIANUS. GOULD.

(AUSTRALIAN CRANE.)

GRUS AUSTRALASIANUS, Gould, P.Z.S. 1847, p. 220; Birds of Australia, vi., pl. xlviii. (1848.)

NATIVE COMPANION of Australian Colonists.

The Australian crane is very like *G. antigone* at the first glance, but at once distinguishable by the legs and feet being brownish ashy instead of dull pinkish red, by the nude portion of the head not extending for some distance down the neck, and by the skin of the throat being lax and pendulous, as seen in no other species. It is the *G. antigone* of the older catalogues of the birds of Australia. The description of this species I will quote from Mr. Gould's "Hand-book of the Birds of Australia":

The *Grus australianus* is abundantly distributed over the greater portion of Australia, from New South Wales on the south to Port Essington on the north; but, although it is thus widely diffused, it has not yet been observed in the colony of Swan River, and it does not inhabit Tasmania. It was frequently observed by Leichardt during his overland expedition from Moreton Bay; Capt. Sturt states that it was very abundant on the Macquarie; and I found it numerous in the neighbourhood of the Namoi and on the Brezi Plains in December, 1839, as well as on the low flat islands at the mouth of the Hunter. In these localities it might then have been seen at almost every season of the year, sometimes singly or in pairs, and at others in flocks of from thirty to forty in number.

Like other members of the genus *Grus*, it is stately and elegant in all its movements, and its presence adds greatly to the interest of the scenery. It is not unfrequently captured, and is very easily tamed; when at Paramatta I saw a remarkably fine example walking about the streets in the midst of the inhabitants perfectly at its ease.

[In confirmation of this statement Mr. Gould recounted the interesting anecdote quoted at page 10. The same author's description of its mode of flight is given at page 3.]

It breeds upon the ground usually, depositing its two eggs in a slight depression on the bare plains; but occasionally the low swampy lands in the vicinity of the court are resorted to for that purpose. The eggs are three inches and a half long, by two inches and a quarter in breadth, and are of a cream colour, blotched all over, particularly at the larger end, with chestnut and purplish brown, the latter colour appearing as if beneath the surface of the shell. Its food consists of insects, lizards, bulbous roots, and various other vegetable substances, in search of which it tears up the earth with great facility with its powerful bill.

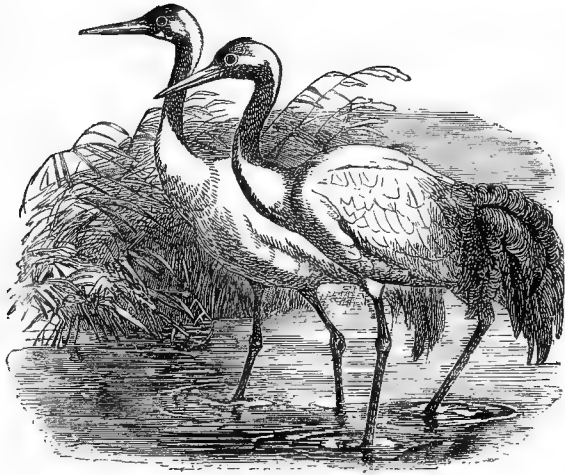
The sexes are alike in colouring, but may be distinguished by the smaller size of the female.

The general plumage deep silvery grey; the feathers of the back dark brownish-grey, with silvery-grey edges; lesser wing coverts dark brown; primaries black; crown of the head [pileus] and bill olive-green, the bill becoming lighter towards the tip; irides fine orange-yellow; raised fleshy papillæ surrounding the ears and the back of the head fine coral red, passing into an orange tint above and below the eye, and becoming less brilliant on the sides of the face, which, together with the gular pouch, is covered with fine black hairs [unwebbed shafts of feathers], so closely set on the latter as almost to conceal the red colouring of the skin; upper part of the pouch and the bare skin beneath the lower mandible olive green. In old males the gular pouch is very pendulous, and forms a conspicuous appendage; legs and feet purplish black. Total length 48in.; bill $6\frac{1}{2}$ in.; wing 24in.; tail $4\frac{1}{2}$ in.; tarsi $10\frac{1}{2}$ in.

The flocks in which it is sometimes seen consist in all probability of unmated yearling birds. I suspect that the various members of the *Sárás* group of cranes never breed until two years old, whereas the cranes of the *G. communis* section propagate when one year old, the American White Crane (*G. americana*) being well known to breed before attaining its white plumage. It has nevertheless been asserted that *G. communis* does not propagate before its second year.

[An admirable figure of this species is given in Gould's Birds of Australia, Vol. VI., and a drawing of the head from a specimen in the Zoological Gardens is given in Plate 1, fig. 4, of the present work.]

We now come to the well-marked group of cranes exemplified by *Grus communis*, the species of which have broad and erectile tertiaries, the webs of which are more or less discomposed according to the species. In all but one of them the legs and feet are of a brownish slate colour.



GRUS VIRIDIROSTRIS. VIEILLOT.

THE MANTCHURIAN CRANE.

GRUS JAPONENSIS, Briss. Ornith. v. 381. (1760.)

GRUS VIRIDIROSTRIS, Vieillot, Encycl. Méth., iii., p. 1141. (1823.)

GRUS COLLARIS, Temm. Planch. col. (sub. tab. 449). (1828.)

ANTIGONE MONTIGNESIA, Bp. Compt. rend. xxxviii., p. 661. (1854.)

GRUS MONTIGNESIA, Wolf, Zool. Sketches, Series I., pl. 46. (1861.)

GRUS MONTIGNESIA, Wolf, P.Z.S., 1861, pl. 35 (Young).

[Mr. Blyth described this species under the name of *Grus Japonensis*, Briss., but Mr. P. L. Sclater, in the notes which he has favoured me, writes as follows :

Brisson's authority to give *specific* names not being allowed by the Stricklandian code of nomenclature—the earliest name applicable to the present bird seems to be *viridirostris* of Vieillot (Enc. Méth. p. 1141), based upon Brisson's description. The term *collaris* bestowed upon it by Temminck, in his "*Planches Coloriées*" (sub. tab. 449), had been previously assigned by Boddaert to another species. See page 45.]

The Mantchurian Crane is conspicuously much larger than the common species, and of precisely the same subtype ; but the plumage is pure white, except the throat and middle of the neck all round, continued to a point towards the base of the neck behind, which are ashy-black, and the grand tufts formed by the erectile tertiaries and their disunited webs, which are black ; forehead and crown bare and crimson, the former concealed by black bristle-like plumelets ; bill and feet dull green ; irides very dark, appearing black in the living bird ; the ear-coverts are white, the ashy black extending partly round them behind. The sexes hardly differ in external appearance.

Mr. Sclater, in the letter-press accompanying Mr. Wolf's admirable pourtrayal of this magnificent species, suggests that the name *japonensis* implies an erroneous habitat; but, as I have seen it unmistakably represented upon Japanese screens (as the white-naped crane is much more commonly), and also on sundry other Japanese drawings, I think that it might safely enough be assumed, without further evidence, that it does occur in the Japanese archipelago, rather than that it is there occasionally imported from China. Indeed, Mr. Swinhoe asserts that it is an inhabitant of North China and Japan. "It is frequently," he tells us, "seen in captivity in Shanghai. It is the emblem of longevity among the Chinese, and the subject of many pictures and works of art." (*Pr. Zool. Soc.* 1863, p. 309.) Subsequently, he states that it is brought to market at Shanghai and at Pekin. (*Ibis.*, 1871, p. 403.) I find also that it is enumerated among the birds of Dauria, of Amur-land, and of Eastern Siberia. In the notice of the White-Naped Crane is cited a Japanese drawing, reproduced by Sir Rutherford Alcock, in which both species are represented. *Vide* also Kämpfer, as cited in the same page. The Manchurian Crane bred for three consecutive seasons in the menagerie attached to the Paris museum; and Mr. Bartlett's elaborate account of the young being hatched and reared in the Regent's Park establishment has already been quoted in detail at page 7. [There is at present a female only of this superb species in the Zoological Gardens, Regent's Park, the head of which is represented in plate 2, fig. 1. The vignette at the commencement of this account is reduced from Mr. Wolf's delineation.]

GRUS AMERICANA (LINN.).

WHITE OR WHOOPING CRANE.

ARDEA AMERICANA, Linn. Sys. Nat. 1, 234. (1776.)

LA GRUE BLANCHE D'AMÉRIQUE, Buff. Pl. Enlum., 889. (1783.)

GRUS STRUTHIO, Wagler, Syst. Av. Sp. 6. (1827.)

GRUS HOYIANUS, Dudley, Proc. Phil. Acad., vii. p. 64. (1854.)

This species is commonly styled the Whooping Crane, and sometimes popularly miscalled "The White Stork." It is rather larger than *G. communis*, with more robust bill; the plumage of the adult pure white, with the exceptions of the wing primaries and winglets, which are black, and a slaty occipital patch corresponding to what is seen in *G. communis*; webs of the erectile tertiaries partly discomposed, but not to so great an

extent as in *G. communis*. The red skin of the crown does not extend nearly so far back upon the occiput as in the other now well-known American species, the Blue or Sandhill Crane (*G. canadensis*), and terminates in an obtuse point behind, in lieu of being there distinctly furcate. On the forehead, lores, and cheeks the warty and granulated skin is much concealed by black setaceous or unwebbed feathers. Irides pale yellow. Bill dull black, rosaceous towards its base; the legs also blackish. Length to end of tail, 54in.; wing, 22½in.; expanse of wings, 92in. (Audubon). The young are of a light ashy colour, paler on the throat and front of neck, with dull rufous margins to the wing feathers, and the occipital region is also dull rufescent. Head wholly feathered. There is a good specimen thus coloured in the British Museum, and also another with similar but much worn plumage; but no example of the adult. In the Regent's Park collection, however, there are characteristic living adults of both this species and the Sandhill Crane (*G. canadensis*) from which my descriptions of the adult birds of these two species have been taken.

In the "Fauna Americana-borealis" the mature and young birds are described as different species, probably from the fact that the young propagate before assuming the snow-white plumage, although (as it would appear) having attained to the full size, inasmuch as the length of body is given—doubtless from measurement of dry skins—as 48in. only, which still is too great a length for *G. canadensis*, with which the young of the present species has been so often confounded. According to Sir J. Richardson, the plumage of those immaturesly-coloured breeding birds is "yellowish-grey; dorsal plumage glossed with ferruginous; neck above ash-coloured; cheeks and throat brownish-white. All the upper surface of the head, before and between the eyes, covered with a red skin, pretty thickly clothed with black hairs." "Immature specimens," writes Professor Spencer Baird, referring to still younger birds, "have the entire head covered with perfect feathers to the bill; the feathers with black shafts on the regions which in adults are covered only with black hairs. Colour of head and neck, pale greyish chestnut.

[A very spirited coloured representation of the young bird is given in the Transactions of the Chicago Academy of Sciences, vol. I., 1867-9, showing the light rufous brown of the head, upper part of the neck and the tertiaries; in the accompanying text it is stated to be "not unfrequently found in the vicinity of Chicago; though so different in its colours and its feathered head from the adult white crane, it is now believed to be the young of that species." When first discovered it was regarded as distinct, and was named by Dudley, *Grus hoyianus*, after Dr. Hoy, Proc. Phil. Acad. 1854.

We are informed by Dr. E. Coues, that there are two eggs from the Great Slave Lake in the Smithsonian Institution.

Though from the same nest, one is noticeably more elongated than the other,

measuring about 3.90 by 2.65, the other being about 3.60 only with the same width; the shell is much roughened by numerous elevations like little warts, and is moreover punctulate all over. The ground is a light brownish drab; the markings are sparse except at the great end; they are large irregular spots of a dull chocolate brown with still more obscure or nearly obsolete shell markings.]

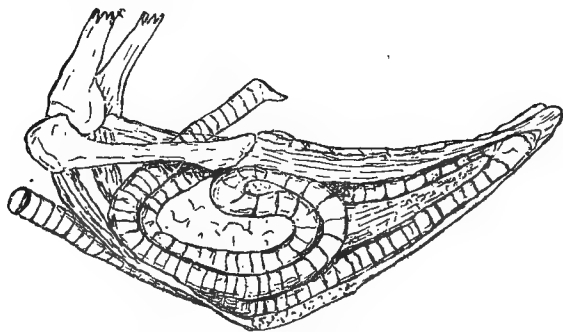
Until comparatively quite recently, the ornithologists of North America knew absolutely nothing of what is now generally recognised by them as their Blue or Sandhill Crane, which is so abundant a species westward of the Rocky Mountains. Wilson rightly conjectured that the two figures by Edwards, pl. 132 and 133, represent adult and young of the same species; and Audubon's two figures appear to me to have been "made up"—that of the young especially—"from the depths of his own moral consciousness." I do not believe that his coloured representation of the alleged young of *G. americana* is like anything in nature! His figure of the mature bird exaggerates the aspect of the crimson facial skin, and does not properly show the ashy occipital mark, as does that of Buffon better than do those of either Edwards or of Wilson. It is easy to perceive that not one of these figures is taken from the life, or the bill would not be represented as being yellow, as it is by Audubon as well as by Wilson. Audubon writes, however, "bill dusky, towards the base yellow," which indicates a description taken from a dry skin. Nevertheless, the French-American ornithologist was familiarly acquainted with the species, not only in the wild state but in captivity, as he states that he kept one alive which was nearly full-grown when he obtained it, "and its plumage was changing from greyish-brown to white." Besides, he describes the habits of the bird admirably and most correctly. He furthermore asserts:

I had, in 1810, the gratification of taking Alexander Wilson to some ponds within a few miles of Louisville, and of showing him many birds of this species, of which he had not previously seen any other than stuffed specimens. I told him that the white birds were the adults, and that the grey ones were the young. Wilson, in his article on the Whooping Crane, has alluded to this, but, as on other occasions, has not informed his readers whence his information came.

Neither does Audubon condescend to inform his readers that his two figures of *Grus americana*, adult and young, are decidedly not studies from the living birds, as it seems he fully intended us to understand. Neither he nor Wilson had the remotest suspicion of the existence of any other species of crane in North America, as that to which the name *canadensis* has since been currently transferred, and so late as in 1844, when De Kay's volume on the zoology of New York was published, nothing was still known to that naturalist of the veritable Sandhill Crane, as now usually recognised by that appellation; and he remarks that "Dr. Bachman has conclusively demonstrated the identity of the [supposed] two species."

[The remarkable differences between the arrangement of the trachea in the Whooping and Sandhill Cranes has been admirably illustrated and

described in the "American Naturalist," 1880, p. 108, by Mr. Thomas S. Roberts, who gives an engraving, from which the following outline is taken, to show the extreme extent to which the convolutions are produced in *G. americana*, and quotes the description given by Dr. Coues, in his "Birds of the North West."



CONVOLUTIONS OF THE TRACHEA IN THE STERNUM OF *GRUS AMERICANA*.

"The sternal keel is broad and tumid, and is entirely excavated. The greater part of the excavation is occupied by the singular duplications of the trachea; but there are two—an anterior and a posterior—large empty air cells in the bone, with smooth walls, and two other air cells—one superior, and one along the edge of the keel—filled with light bone meshwork. . . . The trachea, entering the apex of the keel, traverses the whole contour of the keel in a long vertical coil, emerges at the front upper corner of the keel, enters again at the lower corner of the keel, and makes a smaller vertical coil in the centre, emerging again where it went in. On looking at the object from the front, we see three parallel vertical coils side by side; the middle one is the trachea coming down from the neck above, on the left hand is the bulge of the first great coil, on the right is the windpipe passing to the lungs after it has made its second coil inside." . . . There are about twenty-eight inches of windpipe coiled away in the breast bone. . . . Altogether the Whooping Crane has a windpipe between four and five feet long, quite as long as the bird itself.]

According to Sir J. Richardson :

This stately bird frequents every part of the fur countries, though not in such numbers as the brown crane (*i.e.*, the very same species in the plumage of immaturity). It migrates in flocks, performing its journeys in the night, and at such an altitude that its passage is known only by the peculiarly shrill screams which it utters. A few pass the winter in the southern parts of the United States: but the greater part go still farther south. It rises with difficulty from the ground, flying low for a time, and affording a fair mark to the sportsman; but, if not entirely disabled by the shot, fights with great determination, and can inflict very severe wounds with its formidable bill.

Aye, and scratch too, as a matter of course, with the hooked claw of its inner toe, like its congeners. Of his "brown crane," remarks the same distinguished Arctic explorer as well as highly accomplished naturalist, "This crane visits all parts of the fur-countries in summer up to the shores of the Arctic Sea." Its breeding in the immature dress, as the same

author avers (in the supposition that such birds constitute a different species), is highly remarkable, and the more so because such decidedly is not the case with the Asiatic White Crane (*G. leucogeranus*), as Mr. A. O. Hume's observations show conclusively, and the more nearly allied European crane (*G. communis*) is likewise stated not to propagate before its second year. Mr. Baird gives as the habitat of *G. americana* "Florida and Texas, with stragglers in the Mississippi Valley," not at all noticing its migrations! But Edwards (in 1750) identified his white bird, the skin of which was received from the Hudson's Bay territory, with that of which the head is figured in Cateby's "History of Carolina," and sensibly argues therefrom the migratory habits of the species.

Nevertheless, it appears that some pairs remain to breed in the South. Mr. E. Dresser, in his "Notes on Southern Texas," published in the *Ibis* for 1866 (p. 30), states:

On my first visit to the town lagoon at Matamoras, in June 1863, I saw a couple of this crane, and subsequently saw a small flock of seven or eight; but they were so wary that I only succeeded in shooting two, one of which fell into the Rio Grande and was lost. I inquired of the Mexicans as to where they bred, and was told that their eggs could be procured at a lagoon some distance to the south-west of Bagdad (Boca del Rio Grande); but, partly owing to the want of leisure, and partly to the unsettled and dangerous state of the country, I was unable to go there. On my return to Matamoras I saw none of the lagoons there. During my rambles in Texas I only saw this bird on two or three occasions near San Antonio, and once at Point Isabel; but I was told that it was occasionally seen on Galveston Island, and at the mouth of the Brazos River.

In winter he would doubtless have met with it abundantly. Mr. Henry Youle Hind, in his "Narrative of the Canadian Red River Exploring Expedition of 1857, and of the Assiniboine and Saskatchewan Exploring Expedition of 1858," mentions that, at about 51° N. lat. and 104.5° E. long., "beyond the Weed Ridge the country is very undulating; boulders of Silurian limestone were strewn on the flanks and summits of the hills. The White or Whooping Crane (*Grus americana*) was first seen to-day. This beautiful bird is common in the Qu'appelle valley and in the Touchwood Hill range." A few pages on the same author remarks that "white cranes appeared in flocks of four and seven together, but they were so wary that it was impossible to shoot them."

GRUS COMMUNIS. BECHST.

THE COMMON CRANE.

- ARDEA GRUS, Linn. Syst. Nat., vol. i., p. 234. (1766.)
 GRUS COMMUNIS, Bechst. Vög. Deutsch, vol. iii., p. 60. (1793.)
 GRUS CINEREA (Bechst.) Meyer, Tasch. deut. Vög., vol. ii., p. 350. (1810.)
 GRUS VULGARIS, Pall. Zoogr. Rosso-As., vol. ii., p. 106. (1811-31.)
 GRUS CINEREA LONGIROSTRIS, Temm. & Schl. Fauna Jap., p. 117. (1850.)
 GRUS CINERACEA, Brehm, Naumannia, p. 289. (1855.)
 GRUS CINEREA, Gould, Birds of Europe, vol. iv., pl. 270.
 GRUS CINEREA, Gould, Birds of Great Brit., vol. iv., pl. 19.
 GRUS COMMUNIS, Dresser, Birds of Europe, part 18 (adult and young)

THE Common Crane of Europe and Asia generally, which also visits North-East Africa in winter, its former range of distribution extending from Ireland to Japan. There appears to me, however, to be an oriental race and an occidental race, which have not hitherto been discriminated. The western form has black tertiaries, and the naked skin of the crown is much more developed in the breeding season than it ever is in the race which is a common winter visitant in India; and in the latter or oriental race the tertiaries are about concolorous with the rest of the plumage, having merely black tips. During the whole period of my stay in India, my late friend Bábu Rajendra Mállika kept some twenty or thirty of the northern Sárás Crane (*G. collaris*), a dozen or more of the common species (*G. communis*, var. *orientalis*), and some two or three dozen of the Demoiselle Crane (*G. virgo*), and I was in the constant habit of observing them at all seasons; but never did I see in the Indian bird any approach to the fine crimson poll which I have subsequently remarked on several European examples of *G. communis*, there being only a narrow band of red skin crossing the vertex. The general plumage, too, of the oriental bird is decidedly browner, and permanently so at all ages and seasons. The two bred together some four or five years ago in the Regent's Park Gardens, and the figure given in Dresser's "Birds of Europe" is uncommonly like the mixed offspring of the two, only not brown enough, the eastern form being never nearly so grey. The western form should have the crimson much more developed on the vertex and occiput, and the tertiaries should be contrastingly much blacker. Both have the neck dull white, with forehead and occipital mark ashy black, as are also the throat and whole front of the neck, leaving only the sides and lower part of the neck behind of a somewhat subdued white. Buffon's or Daubenton's figure in the "Planches Enluminées" (pl. 769) is somewhat more true to life, but represents an adolescent bird. The late Mr. G. R.

Gray's life-size figure of the head and upper part of neck in his "Illustrated Genera of Birds" was certainly not taken from a living specimen. In the "Vögel Europas" of Dr. A. Fritsch (1870) the figure of the Common Crane is stiff, but the proper extent of the crimson poll is represented, and the tertiaries are contrastingly black, which is never the case (so far as I have observed) in the eastern form; but the crimson poll should have been represented as being much more conspicuous. The same remarks apply to the figure of the Common Crane in the "Ornithologie Provencale" of M. Polydore Roux (pl. 326), but in this figure the general colouring of the body plumage is too pale. The chick, as figured by Mr. Dresser, is remarkable for its bright rufous colouring throughout.

The erectile tertiaries in the Common Crane are very broad, with their webs much discomposed, and when raised they show to greater advantage than in any other species of the genus, having considerably the aspect of ostrich plumes. I cannot recall to mind a single characteristic figure of the species when strutting proudly and with fully raised tertiary plumes. The irides are reddish; the bill greenish brown, much lighter at the base, dull flesh-coloured at the base of the lower mandible; legs blackish-grey. The female, as usual, is noticeably smaller than her mate. Weight of the latter about ten pounds.

Albin, writing in 1738, remarks of the Common Crane that—

The stomach or gizzard is muscular, as in granivorous birds; the flesh is very savoury and well-tasted, not to say delicate. They often come to us in England, especially in the fen countries in Lincolnshire and Cambridgeshire; but whether they breed in England or not is not determined.

[Mr. Blyth appears to have overlooked the fact that this passage is taken almost *verbatim* from Ray's translation of Willughby's *Ornithologia*, p. 274, published in 1678.]

Pennant, in 1785, remarks that—

Cranes arrive in Sweden in great flocks in the spring season, pair, and disperse over the whole country; and usually resort to breed in the very same places which they have used for many years past. No augural attention, he adds, is paid to them there; yet Hesiod directs the Grecian farmer to think of ploughing whenever he hears the annual clamour of the cranes in the clouds.

In Griffith's edition of Cuvier's "Animal Kingdom" it is remarked that the various inflections of their flight have been regarded as presages of the weather and indications of atmospheric temperature. Their cries in the daytime are ominous of rain, and, according to the poet Virgil,

illum surgentem, vallibus imis,
Aëriæ fugère grues.

More noisy clamours announce the coming tempest; a steady and elevated flight in the morning or evening forebodes serene weather; a lower flight, or a retreat to the earth, is the symptom of a storm.

Mr. Dresser, in his "Birds of Europe," has given an elaborate and exhaustive account of the distribution and habits of the Common Crane. Amongst other observations he remarks that "it is also very common in Eastern Siberia, and does not differ in any way from the European bird." This, however, I must consider doubtful for the present, as the oriental race, which visits India in winter, is distinguishable from the occidental race, as already noticed. Père David remarks of *G. communis* that it "passes over the Pekin plain in September and April, being common towards Mongolia."

[This ends Mr. Blyth's somewhat brief account of this species, which I think it desirable to supplement by information from other sources. The most interesting account of this bird in its Oriental habitat was written by the late Col. Tickell. As this account, now existing in manuscript in the library of the Zoological Society, is not generally accessible, I reproduce it in full, with some additions made by the author for publication in *The Field*. I reprint Col. Tickell's description in full, as it is of interest when taken in connection with Mr. Blyth's suggestion as to the existence of two local races of this species.

Iris orange-yellow, bill pale dull green, with flesh-coloured tip and gape; legs and feet black; crown bounded by a line from the gape to the under eyelid, covered by a black papillous skin and short recumbent hairs. A line of narrow ashy feathers along mesial crown, joining the plumage at the occiput, where the black skin of the crown is bounded by a red space, equally covered with black hairs, and immediately succeeded by the plumage; this all over the body is pale French grey, with the tips and end halves of outer web, and margins of the scapulars, and the tertials blackish. From the eye, embracing its postear half and all the under eyelid, over ear coverts and down along the hind neck for half its length, extends a broad white band; but along the mesial line of the hind neck runs a line or mane of dusky grey feathers. The rest of the head and face, and all the fore neck, blackish or greyish black, ending where the white ends, half-way down the neck. Quill feathers ashy black.

A mature but not old male, killed by me on the Kalichowk river, Malda district, Dec. 23, 1843, measured in length 3ft. 8in., and spread 6ft. 6in.; wing, 1ft. 9½in.; tail, 8½in.; bill, 4 3-16in.; tibia, 10½in.; tarsus, 9 5-8in.; middle toe, 3½in.; neck, 1ft. 4in.

The female resembles the male. The young are paler and duller, with the grey of the plumage soiled with tawny, and the white and black of the neck are hardly distinguishable from the general colour of the body.

The crane is in India, as in Europe, a bird of passage, appearing about November in the plains of Hindostan, and departing in February. It is common throughout the Bengal presidency during that period, but does not extend far to the eastward. I never observed it in Arracan, nor in any part of Burma or Tenasserim. It spreads over the open parts of Tirhoot, but avoids the more wooded country of eastern Poorneea, Bhaulia, and Dhaka; and is altogether unknown to the vast forests of the Teraie, the Morung, the Soonderbuns, and Chittagong. It keeps far away also from hills—even the low and scantily clad ones of Chota Nagpore—where, in many years of wandering, I have never seen this bird.

Throughout the Punjab and the North-west Provinces, and Central India, from Oude inclusive, as far south as Moongher, it is found in great flocks. How far it extends to the west and south-westward, I know not. Jerdon speaks of it as occurring

in the Dukhun in parties of six or eight to twenty. These are probably stragglers from the main army. It keeps entirely to open, dry country, in the vicinity of the Ganges and other large rivers which have extensive sand flats bordering their streams. During the day they are generally observed high in air, seldom coming to the ground unless in the most solitary places, when they rest on isolated sand islets in the river, or on the highest parts of wide barren tracts, clear of any covert which might conceal the approach of an invader; and at all times they are most wary and difficult of approach.

In serene weather in the cold season, when, though the skies are cloudless blue, the mild atmosphere enables the sportsman to roam all day long over miles of far-stretching plains, the sonorous trumpet call of the crane is one of the most familiar sounds that meet the ear. The cry resembles the syllable "kurrk," a single loud brassy note, harsh and metallic, but mellowed by the vast distance at which it is generally heard. At such times the birds may be seen high in the air, advancing in an angle or in a single diagonal line, winnowing their way across the pathless vault to distant regions, or soaring round and round in irregular swarms, and independently, as if reconnoitring the country below to select a fit place for their nocturnal meal. When thus employed sometimes two or more parties meet, and the clamour amongst them then becomes extreme, like the mutual clacking and cackling of assembled geese. Should the country, as before said, be quite open, and no human being be observed moving on the plain, they will sometimes descend to the ground in the daytime, and on such occasions the downward sweep, from a height of perhaps a mile in the air to the face of the earth, of two or three hundreds of these large birds, is a majestic spectacle, though of necessity only to be seen from afar.

I once, indeed, met with a striking exception to this wary habit of the crane in keeping, during the day, out of gunshot in the air. In January, 1845, as I was one day riding along the Trunk-road (as the old Government road from Calcutta to Delhi is called), in the district of Mánbhoom, near the village or chowkee of Niamutpoor, I came in sight and within point-blank ball shot of a host of these birds collected in a rice stubble field. There was a prodigious concourse of them, amounting probably to a thousand. They were making a deafening clamour, and seemed in great agitation, while every now and then a party of them would take wing and fly off, generally to the eastward, towards the Damoodur river, but many went in other directions. The country in the vicinity was open and wild, with bushes scattered about, and here and there a cultivated patch; the hour early in the morning. By sunrise they had all disappeared. I was told by the villagers that as night fell the birds would return and reassemble in the same spot, and that they had been in the habit of doing so for many years. I confess I was never more astonished at anything within the circle of ornithology than at this instance of exception to the wild and wary habits of the crane. They could not have assembled in the field (which was not a large one) to feed, as the grain in the stubble would not have afforded a night's meal to a tenth part of the flock. The most probable conjecture is that they fed elsewhere during the night, as is the wont of the bird, and repaired to that particular spot to rest till dawn, congregating in separate and independent parties. But why they should have collected night after night in a spot so near a village, and so liable to approach, is inconceivable. The people of the vicinity are, it must be noted, no shikaries, and the report of a gun was probably a sound almost unknown in that part of the district. The crane, like most water fowl, feeds at night, more as a matter of precaution than by choice. No such nocturnal habits are perceived in tame individuals, nor, it is probable, in the wild steppes of Tibet or Siberia, where these birds breed unmolested, and roam about free from the sight even of a human being.

In India, after filling their crops with the gleanings from the rice and vetch stubbles, the cranes retire at or soon after sunrise to sand flats or islets in large rivers, or to

open downs inland, where no covert affords means of approach to an enemy. And there they may be seen through a telescope, preening themselves, lazily stretching forth their legs or wings, or sitting dozing on their heels. One or two, however, keep on the alert, their heads raised on high; and these, to judge by their size and flowing plumes, are old males.

The flesh of this bird, when young, is most delicious. It joins the delicacy of the florian to the juiciness of the young wild duck; and to bag one is well worth a few hours' toil and trouble. It requires about a dozen beaters or coolies to effect this. When a party of cranes is descried resting on an open spot, the sportsman makes for a bush, hillock, or ravine, where he can sit invisible to the birds, while the beaters are sent to the right and left to arrange themselves in an open cordon completing the circle round the game; but at a considerable distance, of course, from it. This takes a long time, and requires no little patience in the gunner and sagacity in the beaters—a quality they do not generally shine in. When the latter have approached, converging towards the cranes, the birds begin to trumpet, and walk, but not many paces, before launching into the air. Their flight is usually, as may be conjectured, towards the apparently vacant quarter where the sportsman lies concealed. And no sight can well be more intensely gratifying than that of their waving wings and outstretched necks as they come towards you. When they pass over, throwing their shadows on the ambushed foe, they offer of course a sure and easy mark. The field naturalist should select the leading bird, as the oldest and finest "specimen;" but he who hath an eye to the pot and an ear for the dinner bell allows the former to pass by, and before these, giving the alarm, can alter the course of the approaching line, the rearmost or young birds are already overhead, and each barrel brings down its victim. There is no chance, of course, of another shot that day.

I did once, and only once, catch these birds napping. They had selected in the Kalichowk, a stream or branch which joins the Mahanuddee to the Ganges (Malda district), an islet of sand and clay for their diurnal repose, which, from its banks being scarped, allowed a boat to creep along under the shore unseen from the *terre pleine* of the island. Selecting a spot for landing which was not above a hundred yards from the nearest of the birds, I made them drop my little shooting dinghee down to it, then, jumping ashore, scrambled up the bank, and (further concealment being impossible) at once ran as hard as I could pelt towards the birds (who require a little time to get fairly on the wing). Firing both barrels into the flock as they rose some fifty yards off, I was fortunate enough to wing one, which fell into the river. *It swam well*, and reached the shore opposite, where some fishermen were assembled, who attempted to seize it as it landed; but the bird made such vigorous use of its beak that it held its assailants at bay till I reached the spot. It was a young male—its tertial plumes not fully developed, and its stomach was found to be crammed with ooid (a kind of vetch).

The crane breeds in summer, within or close to the Arctic circle. The eggs are two in number, as with the sarus, 4in. long by 2½in. broad, of a pale greenish olive-brown, blotched and spotted with darker shades of the same. The nests are constructed on the ground in marshy swampy places, and are said to be sometimes placed on the roofs of deserted houses.

The migrations of the crane appear to extend all over Europe, North Africa, and Asia, though to the extreme N.E. of the former continent it is said to be replaced by another species, *Grus longirostris*, which I have never seen. In Europe it would appear to stay a very short time. Temminck says it visits Holland, but is rare there, and only met with in severe winters. Over the Mediterranean it is annually seen flying during its migrations to and fro, occasionally stopping on some of the islands, but not for long. March, April, and October are the months in which it is observed in the Ionian Islands, Malta, and Gozo.

A description of the crane would be very incomplete without noticing its extra-

ordinary powers of voice, and the anatomical structure of the trachea or windpipe, which enables the bird to make its trumpet tones audible for more than a mile distance. I have myself heard its sonorous cry from overhead when the bird has been barely distinguishable. The trachea extends along the keel of the sternum for nearly its whole length; it then turns back at an acute angle as far as to the base of the clavicle, then down and backwards to the keel again, near the angle of the furcula or merrythought, and then forwards, upwards, and backwards into the bronchiæ. The keel of the sternum or breastbone is grooved shallowly, so as to admit a little the trachea, and its convolutions are conducted through the two lamina or layers of the breastbone. The whole forms a perfect bugle or cornet.

The convolutions of the trachea in the Common Crane are figured by Yarrell in his *British Birds*, a work which is so well known that I have not thought it necessary to reproduce the illustrations.

Col. Tickell gives the following as the vernacular names of this species. It is the "Kullung" of northern Hindostan and Upper Bengal, and "Kullum" of the Murhuttas; "Kullungee" (Teloogoo). It is commonly confounded with the Demoiselle crane (*Grus virgo*) by Hindustanees, and called "Kurkurra;" "Koonj" (Persian); "Agoo mara" (Koles).

With regard to the migration of this species in Asia, Lieut.-Col. Prjevalski, in "*The Birds of Mongolia, the Tangut country, and Northern Tibet*," states:

In all the countries we traversed, the crane is only a migrant. Its migration takes place from the end of March until the middle of May. The autumnal migration occurs in September. In the middle of this month we noticed in Ala-shan passing flocks, which, when tired out and not finding a suitable resting-place, settled down on the sand in order to pass the night there and to proceed on their journey next morning.

In Kan-su we saw, in autumn as well as in spring, cranes on their passage only once each season, *i.e.*, on the 11th of Sept. 1872, and on the 20th of April, 1873, and in both cases at the same place, south of the river Tetunga. Our tent there was pitched at an absolute height of 10,600ft.; but these birds were flying at such an enormous altitude that they could hardly be seen. During the whole day one flock seemed to follow the other. At Koko-nor they arrived on the 17th of March. We did not find *G. communis* in the Ussuri country.

The range of this species is not confined to the mainland of Asia, but extends to the islands to the east. It is well known in Japan, and Consul Swinhoe, in his notes on the Ornithology of Hainan, states that it is seen in all parts of the island.—*Ibis*, 1870, p. 365.

"In the Holy Land," writes Canon Tristram, "the crane is well known, and is, next to the ostrich, the largest bird in the country. It only visits the cultivated region at the time of its spring migration, when a few pairs remain in the marshy plains, as by the waters of Merom, but the greater number pass onwards to the north. In the southern wilderness, south of Beersheba, it resorts in immense flocks to certain favourite roosting-places during winter. The clouds of these enormous birds, four feet high and many eight feet from wing to wing, quite darkened the air towards evening. Their roosting-place was marked like some resort of seafowl—a gently sloping isolated knoll, where no ambush was possible, and where they could

keep a good look-out on all sides. Their whooping and trumpeting enlivened the watches of the night, and till dawn we could hear the flocks passing overhead on their way to their quarters close by."

Blanford in his *Zoology of Persia*, vol. ii., p. 286, says:

It doubtless may be found in many parts of Persia during the migratory season, and it is probable that *G. virgo* and *G. leucogeranus* both visit parts of Persia at times, both being found in India, and also on the shores of the Caspian. I saw flocks of cranes flying overhead on two or three occasions in Baluchistan about March, either the common or the Demoiselle. Major St. John says cranes are very plentiful in southern Persia, but very wary.

The General Migration of the Common Crane is thus described by Prof. Newton.

The Crane's aerial journeys are of a very extended kind; on its way from beyond the borders of the Tropic of Cancer to within the Arctic Circle, or on the return voyage, its flocks may be described passing overhead at a marvellous height, or halting for rest and refreshment on the wide meadows that border some great river, while the seeming order with which its ranks are marshalled during flight has long attracted attention. The Crane takes up its winter-quarters under the burning sun of Central Africa and India, but early in spring returns northwards. Not a few examples reach the chill polar soils of Lapland and Siberia, but some tarry in the south of Europe and breed in Spain, and, it is supposed, in Turkey. The greater number, however, occupy the intermediate zone and pass the summer in Russia, North Germany, and Scandinavia. Soon after their arrival in these countries the flocks break up into pairs, whose nuptial ceremonies are accompanied by loud and frequent trumpetings, and the respective breeding-places of each are chosen.—(*Encyl. Brit. Art. Crane.*)

In an article on "Taking Passage Hawks in Holland," Mr. J. E. Harting, referring to the migration of birds across the great heath of Valkenswaard, in North Brabant, thus incidentally alludes to the Common Crane.

The falconer's hut would be a rare post of observation for any naturalist desirous of studying the subject of migration; and many an interesting sight would reward his patient and lonely watching.

Early one morning a vast number of cranes appeared; seven flocks, numbering in all about a thousand birds, arrived in succession, and alighted upon the heath about one hundred and fifty yards from the hut. Each flock as it appeared was hailed with noisy greetings by the first comers, and the whole company with outstretched wings performed many strange evolutions. They rested for several hours, and then, with loud cries, rose upon the wing and took their departure, affording a strange and never to be forgotten spectacle.—(*Field*, March 16, 1878.)

In Great Britain the Crane is now only an occasional visitant. One immature specimen, which was shot at Aberdeen in May, 1851, was the last bird examined by Macgillivray before his death. Four specimens shot and several others seen in 1869, were recorded by Mr. H. Stevenson, in *The Birds of Norfolk*, vol. ii., page 125. The author in a communication to *The Field* remarked that the occurrence of so many of these rare visi-

tants in one season was the more remarkable, as he was not aware of more than four examples having been killed in Norfolk during the last half century.

Of the nesting of this species in Europe little was known until the publication, by Mr. J. Wolley, of his "Account of the Breeding of the Crane in Lapland" in the *Ibis* for 1859. As the volume has been long out of print, and very difficult to procure, I have much pleasure in reproducing this most interesting article in full.

Mr. Wolley states :

In common with, I believe, most people interested in such matters, I was long entirely in ignorance as to the condition in which the young Crane (*Grus communis*) would be found on first leaving the egg, whether helpless like a young heron, or able to run about like the young of most waders and of gallinaceous birds. The late Prince Charles Bonaparte had inclined to think that they would long continue nestlings; Mr. Gould, as he assured me, had always opposed the probability of this opinion.

It was on the 15th June, 1853, that I entered the marsh which the well-known Pastor Læstadius had told me was the most northern limit in Lapland of the breeding of the Crane. It is in Swedish territory, being on the west side of the frontier river, opposite the Finnish (Russian) village of Yli Muonioniska, in about lat. 68°, that is, some distance within the Arctic Circle. This great marsh, called "*Iso uoma*," is mostly composed of soft bog, in which, unless where the bog-bean grows, one generally sinks up to the knees, or even to the middle; but it is intersected by long strips of firmer bog-earth, slightly raised above the general level, and bearing creeping shrubs, principally of willow and dwarf birch, mixed in places with *Ledum palustre*, *Vaccinium uliginosum*, *Andromeda polifolia*, *Rubus chamæmorus*, besides grasses, *carices*, mosses, and other plants. There were also a few bushes or treelets of the common birch, and these quite numerous in some parts of the marsh.

Walking along one of these strips in a direction where the pair of Cranes was said to be often heard, I came upon a nest which I was sure must be a Crane's. I saw one bit of down. The nest was made of very small twigs mixed with long sedgy grass; altogether several inches in depth, and perhaps two feet across. In it were two lining membranes of eggs, and on searching amongst the materials of the nest I found fragments of the shells. We had not gone many yards beyond this place, when I saw a Crane stalking in a direction across us amongst some small birch trees, now appearing to stoop a little, and now holding its head and neck boldly up as it steadily advanced. Presently the lads called out to me that they had found some young Cranes. As I ran towards them, a Crane, not the one I had previously seen, rose just before me from among some bushes which were only two or three feet high, and not twenty yards from the place where the lads had been shouting at least for a minute or two. It rose into the air in a hurried, frightened way. There was nothing just at the spot where it got up, neither eggs nor young. I then went up to where the two little Cranes were found. They were standing upright and walking about with some facility, and making a rather loud "cheeping" cry. They seemed as if they could have left such eggs as Cranes were supposed to lay only a very few days. I say *supposed*, for in England we know nothing of the eggs which are called Cranes', but which may have come from any part of the world. They were straightly made little things, short in the beak, livid in the eye, thick in the knees, covered with a moderately long chestnut or tawny-coloured down, darker on the upper parts, softening away into paler underneath. As I fondled one of them it began to peek playfully at my hands and legs, and when at length I rose to go away, it walked after me, taking me, as I supposed, for one of its long-legged parents

I had only just before been plucking from it some bits of down to keep; for, valuable as I knew it to be in a natural-history point of view, I could not make up my mind to take its life. As soon as I saw its inclination to follow, I took to double-quick time, and left it far behind. Its confidence was the more remarkable as, all the time we were with it, the old Cranes were flying round near the ground at some distance from us, their necks and feet fully stretched out as usual, but with a remarkable sudden casting up of the wings in a direction over the back after each downward stroke, in place of ordinary steady movement. At the same time they were making a peculiar kind of low clattering or somewhat gurgling noise, of which it is very difficult to give an intelligible description, and now and then they broke out into a loud trumpeting call not unlike their grand ordinary notes, which, audible at so great a distance, gladden the ears of the lover of nature. As we went away I saw one of the Cranes alight where we had left the young. Later in the day I had a longing wish to have another look at my young friends. I thought of the old naturalists—who would have called them “peepers” I suppose—one of whom wrote of the Crane in our fens “*ejus pipiones sapissimè vidi.*” To see them nowadays twice in a life, and that not in England, would be a consolation. But it was not to be so; we came back to the spot where we had parted with them, rested for three or four hours round a stone that projected from the marsh, but we saw and heard nothing more of either old or young Cranes. In a morass with another name (which it took from a hill that overlooked it), “*Kharto uoma,*” but which was only separated from “*Iso uoma*” by an interval of a mile or two of birch thicket. There were also Cranes, and I found their nest with the egg-shells lying in the water by it, and so many quill-feathers scattered about, that I almost feared some accident had happened to the sitting bird.

The following year, 1854, on the 20th May, I went with only Ludwig, my servant-lad, to look for the Crane’s nest in “*Iso uoma.*” We saw no birds, and the spot where the nest had been the preceding year was not easy to find in so extensive a marsh. So we quartered our ground, working carefully up one strip of harder bog, and down the next. After some hours of heavy walking I saw the eggs—joyful sight!—on an adjacent slip, in a perfectly open place. The two eggs lay with their long diameters parallel to one another, and there was just room for a third egg to be placed between them. The nest, about two feet across, was nearly flat, and chiefly of light-coloured grass or hay, loosely matted together, scarcely more than two inches in-depth, and raised only two or three inches from the general level of the swamp. There were higher sites close by, and many of them would have seemed more eligible.

It was just at the lowest edge of the strip, but so much exposed, that I thought I should be able to see even the eggs themselves from a spot at a considerable distance, to which I proposed to go. There was a common story amongst the people of the country, that the Crane, if its nest were disturbed, would carry off its eggs under its wing to another place, so I purposely handled one of the eggs, and hung up a bit of birch bark on a birch tree beyond the nest, as a mark by which to direct my telescope. Then I went with Ludwig to a clump of spruce growing on some dry sandy land which rose out of the midst of the marsh. Here I made a good ambuscade of spruce boughs, crept into it, got Ludwig to cover me so that even the Crane’s eye could not distinguish me, and sent him to make a fire to sleep by on the far side of the wood, with strict orders on no account to come near my hiding-place. I kept my glass in the direction of the nest, but it was long before I saw anything stir. In the meantime the marsh was by no means quiet; ruffs were holding something between a European ball and an East Indian nautch. Several times “keet root, keet root,” to use the words by which the Finns express the sound, told where the snipes were. A cock pintail dashed into a bit of water, calling loudly for its mate. The full melancholy wailing of the Black-throated Diver came from the river; watch dogs were barking in the distance; I heard the

subdued hacking of wood and the crackling of Ludwig's fire. It was already about midnight; Fieldfares were chasing each other through the wood; one came pecking about my feet, and another, settling on the branches that covered my back, almost made my ears ache with the loudness of its cries. I often heard the waft of known wings, but three times there sounded overhead the sweeping wave of great wings to which my ears were unaccustomed. I could scarcely doubt it was the Cranes, but I dare not turn up my eye; I even once or twice heard a slight chuckle that must have been from them. At length, as I had my glass in the direction of the nest, which was three or four hundred yards off, I saw a tall grey figure emerging from amongst the birch trees, just beyond where I knew the nest must be; and there stood the Crane in all the beauty of nature, in the full side light of an Arctic summer night. She came on with her graceful walk, her head up, and she raised it a little higher and turned her beak sideways and upwards as she passed round the tree on whose trunk I had hung the little roll of bark. I had not anticipated that she would observe so ordinary an object. She probably saw that her eggs were safe, and then she took a beat of twenty or thirty yards in the swamp, pecking and apparently feeding. At the end of this beat she stood still for a quarter of an hour, sometimes pecking and sometimes motionless, but showing no symptoms of suspicion of my whereabouts, and indeed no manifest sign of fear. At length she turned back and passed her nest a few paces in the opposite direction, but soon came in to it; she arranged with her beak the materials of the nest, or the eggs, or both; she dropped her breast gently forward, and, as soon as it touched, she let the rest of her body sink gradually down. And so she sits, with her neck up and her body full in my sight, sometimes preening her feathers, especially of the neck, sometimes lazily pecking about, and for a long time she sits, with her neck curved like a swan's, though principally at its upper part. Now she turns her head backwards, puts her beak under the wing, apparently just in the middle of the ridge of the back, and so she seems fairly to go to sleep. While she sits, as generally while she walks, her plumes are compressed and inconspicuous.

By this time all birds, excepting perhaps a Fieldfare, are silent. I was now sure the Crane would not carry off her eggs. After enjoying for a short time longer this sight—and no epithet is yet in use which expresses the nature of the feelings created by such scenes in the minds of those who fully enjoy them—I found that the air was freezing. I quietly got up, and on reaching the fire made myself comfortable. Some four hours later, that is between four and five in the morning, we came again to the west side of the hill; there lay the crane, head and neck still invisible; we may have whispered too loud, for she soon raised her head. I now wished to see how she would leave the nest, whether crouchingly or not. I took a line not directly towards it, curving more upon it as I advanced, of course taking care to keep my eyes in a different direction. When I believed that I was just opposite, I looked, as I thought, towards the place, which might be about twenty paces off, but I did not at first recognise the bird. She was a few feet from the exact spot I had expected, and I unconsciously took her for a grey stone, till my eyes turned directly on her. I had then just time to mark her position with her head drawn in between her shoulders, when, having caught my glance, she rose steadily into the air. In one part of the nest was a damp spot, from the water of the marsh having soaked through. The eggs now lay touching each other. When I came to blow them, I found to my surprise that they were one or two days sat upon. In 1855 this nest, Ludwig informed me, was robbed by a Fielfras (*Gulo borealis*). I had the pleasure of showing it, towards the end of the summer of the same year, to my friend Mr. Alfred Newton, who thought the difficulties of the bog fully repaid by the sight even of an empty Crane's nest. We found on this occasion, on examining the materials of the nest, old pieces of egg-shell, showing that it was the same nest that had been used in previous years.

I must not go into long particulars concerning the nest of 1854 in *Kharto uoma*. I

found the two eggs on the 22nd of May, in a spot only two feet from the nest of the preceding year. It consisted of not more than a handful or so of whitish sedge grass, about twenty inches across and two or three inches only above the level of the water of the submerged parts of the marsh, close to the edge of which it was situated. There was a kind of creeping moss about it, and one or two very low-lying shoots of sallow.

It was placed in an open part of the middle of the south-east wing of the marsh. I have a memorandum that there was not then a leaf unrolled, the only visible signs of summer being a kind of *Carex* coming into flower on the hummocks, and yet the nights were quite as light as the day. I kept watch at the distance of nearly half a mile; but unfortunately the smoke of my fire blew towards the nest. I saw a Crane go sailing down, and afterwards the pair walking together, when they indulged in a minuet or some more active dance, skipping into the air as the Demoiselles sometimes do in the Zoological Gardens. Once or so I saw the beak of one pointed perpendicularly to the sky, and a couple of seconds afterwards the loud trumpet struck my ear. It was two or three o'clock in the morning before a bird came on to the nest, and even then she was soon off, but again came back, sitting always with her head up. She left it very wild, when at last we advanced from our bivouac. In this watch I saw and heard many interesting birds, amongst them a Hen Harrier (*Circus cyaneus*). Also a pair of Goshawks (*Astur palumbarius*) dashed into a tree close over my head, the Crane still visible in the distance. These eggs were rather smaller than the pair from *Iso uoma*; two other nests which I have since obtained in Lapland have eggs as big as those which are said to come from Germany and vary as they do. I had the pleasure, in August, 1857, of showing Mr. Frederick Godman and his brother Percy, a nest near Muoniovaara, from which the eggs were taken the same year, and a young one fledged from the same marsh at least, if not from the same nest as in 1856. Their wading to this nest, known to be empty, amidst swarms of greedy gnats, was a satisfactory proof of zeal.

The locality was in a perfectly open part of the rather small marsh, which was scarcely half an English mile across; so that the bird on its nest must have been most conspicuous from every side. It was on a little elevation not more than one stride across, and only raised a few inches above the water. The eggs, on the 5th of June were a good deal sat upon. The finders did not venture to leave them, both for this reason, and because a large hawk was believed to be watching them. They assured me that the birds did not cry, which agrees with my experience of their behaviour when I was near the other two nests.

I went the day after the eggs were taken to see the place. There was still ice enough down in the bog to prevent me sinking beyond a certain moderate depth; not so when the Godmans tried it. The nest, as usual, was of the kind of sedgy grass which grew in the same marsh near the nest. Some of the pieces had been pulled up by the roots. It was twenty-seven inches across, and three or four inches in thickness, perfectly flat, dripping wet in its lowest layers. The birds sailed over our heads to another part of the marsh, where I examined them with my glass.

It will be deduced from what I have stated that the Crane in Lapland is not gregarious when it has once arrived at its summer quarters; that as soon as it reaches its breeding place, for the most part as soon as the snow is mainly off the ground, it repairs its simple nest, and lays its two eggs; for two were in the four nests that have occurred to me, and two generally say those few natives who know anything about the subject. The nest is neither large or concealed. The birds are silent towards intruders on the eggs. The young run probably as soon as, or soon after, they are hatched, and by some means are led or conveyed to a great distance by their parents, after having been disturbed. They have a chesnut or tawny down; no feathers visible in their wings for some time. In Lapland as far as I have heard, in Sweden and Finland generally, the Crane never breeds otherwise than on the ground. It seems not to visit Norway.

The Common Crane has bred in the Gardens of the Zoological Society, Regent's Park. The drawing of the head of this species, Pl. 2, Fig. 6, was taken from a specimen in the Gardens.]

GRUS NIGRICOLLIS, PRJEVALSKY.

THE BLACK NECKED CRANE.

GRUS NIGRICOLLIS, Prjevalsky, Birds of Mongolia, vol. ii., p. 135. (1876.)

[SINCE the publication of Mr. Blyth's monograph one previously unknown species of crane has been discovered by Lieut.-Col. Prjevalsky, who has described it in his work on the "Birds of Mongolia, the Tangut Country, and Northern Tibet." The account was translated from the Russian, and published in Rowley's Ornithological Miscellany, Vol. II., p. 436, as follows :

GRUS NIGRICOLLIS, nov. sp. *Juravl chernosheyney.*

G. communis similis, sed occipite plumoso, rostro longiore, capite, colli dimidio superiore, remigibus omnibus caudaque nigris ; vertice nudo rubro, pilis sparsis.

Measurements of a male—length 48", width 84", wing 25"·3, tail 9"·3, culmen 4"·8, height of bill at the base 1"·32, its width 0"·92, tarsus 10"·2, uncovered part of the knee 3"·8, middle toe without claw 3"·7, its claw 0"·78, hind toe without claw 0"·83, its claw 0"·3.

Culmen greenish horn-colour, lighter on the tip ; the feathered portion of the lower mandible extends 0"·3 further than the side-feathering on the upper mandible ; legs black ; iris golden yellow.

Male.—Head and upper part of the neck smoky black ; crown naked, with a rough red skin, covered with very few small hairy feathers, which cover rather thickly the forehead and lores ; there is a small white spot behind the eyes. The lower portion of the neck, the upper and under wing and tail coverts, and the whole body are of a pale ashy colour, lighter than in *Grus communis*. The inner webs of the large wing coverts are brownish grey ; the larger shoulder feathers are blackish and brownish grey. Wings are dull black ; the tertiaries and their coverts (all of which are black) are elongated, pointed at the end, branched at the points, and turned up and raised above the tail in a patch.

This Crane was found by us only at Koko-nor, in a few pairs, which arrived there on the 30th March, and most likely remained to breed.

The voice of the present species is very pleasant, and much resembles that of *G. leucogeranus*. I had not much opportunity of studying its habits, for soon after its discovery we left Koko-nor, which forms the northern limit of its distribution.

The coloured plate of this species is a facsimile of that in the Russian edition of Col. Prjevalsky's volume.]



GRUS MONACHA, TEMM.

THE WHITE-HEADED CRANE.

GRUS MONACHA, Tem. Pl. Col. 555. (1835.)

GRUS MONACHUS, Temm. and Schl. Fauna Jap., p. 119, pl. 74. (1850.)

ANTIGONE MONACHUS, Bonp. Conspt. Rend. vol. xxxviii., p. 661. (1854.)

About a fourth smaller than *G. communis*, with proportionally shorter bill; the plumage of an uniform dark slaty colour (conspicuously darker than in the common species), with white head and upper two-thirds of neck; forehead, crown, and lores red, forming a *pileus* which is densely beset with black bristle-like plumelets; irides yellow; bill greenish, tinged with red towards base; legs dull reddish. In the original figure supplied by Temminck, an adult is represented with the vanes of the tertiary plumes disunited, but the figure in the "Fauna Japonica" is that of a nearly adult female. This smallest of the Asiatic Cranes (with the exception of *G. virgo*) inhabits the trans-Baikal countries, inclusive of Northern China and Japan, the Korea, and Amurland. According to Swinhoe it is brought to Shanghai market in winter. I have authority for stating that it is a very common species in Japan—too much so to be thought worth sending alive to Europe! It has, however, been exhibited in the Zoological Garden of Amsterdam—[In November, 1876, the Zoological Society of London received the first example of this species, which is still alive in the Society's Gardens, and in fine plumage. The head of this specimen is figured in pl. 2, fig. 8]—and the mounted skin of one may be seen in the ornithological gallery of the British Museum.

[Lieut.-Col. N. Prjevalsky informs us that *G. monacha*

Is very numerous during the spring migration in S. E. Mongolia, *i.e.*, between Lake Delany-nor and the town of Kalgan; further west it does not occur. It is very common about Lake Baikal, and must consequently migrate thither along the borders of the Gobi desert.

We saw the first migrants in S. E. Mongolia on the 15th March; but the principal flocks appeared about the middle of April. A few of these Cranes were seen about Lake Hanka in spring.]

In the following species there are no dark markings on the head and neck, as in the four immediately preceding; the throat and cheeks being conspicuously pure white.

GRUS CANADENSIS (LINN.).

THE BROWN OR SANDHILL CRANE.

ARDEA CANADENSIS, Linn, Syst. Nat. 1, 234. (1766.)

GRUS CANADENSIS, Temm.

GRUS MEXICANA, Briss. (1760.)

GRUS PRATENSIS, Bartram, Trav. in Florida. (1791.)

GRUS FUSCA, Vieill. Nouv. Dict. d'Hist. Nat. vii., 548.

GRUS POLIOPHÆA, Wagler, Syst. Av. (1827.) *Grus* No. 7.

[Blyth described this species under the name of *G. Mexicana*, but Mr. P. L. Sclater, in his notes, states :

"It does not appear to me to be in any way certain Edwards' plate i. 33 (upon which Linnæus founded his *Ardea canadensis*) is intended for the young of *Grus Americana*, it may, with nearly equal propriety I think, be attributed to the present species (N.B., figure *pessima*). I am, therefore, very unwilling to adopt Mr. Blyth's views upon this point, and prefer to continue to call this Crane *Grus canadensis*, in which designation all the American ornithologists also agree."

I have therefore retained that title, and throughout the following description have altered the name of the species from *mexicana*, as originally written by Mr. Blyth, to *canadensis*.—W. B. T.]

Size nearly that of a small European crane, the plumage similarly ash-grey (becoming brownish when the feathers are old and worn), somewhat darker on the tertiaries and more distinctly and conspicuously paler on the neck; the cheeks and throat white; ear-coverts grey; entire crown and occiput nude; the skin much granulated and of a bright crimson colour, with the usual black setaceous feathers on the forehead and lores, this bare crimson patch being broad and obtusely furcate behind. Irides orange yellow; bill greenish mixed with black; legs dusky.

"The young differs from the adult," writes Prof. Baird, "in having the ashy feathers washed more or less with light rusty, especially on the wings, scapularies, occiput, and nape. The feathers of the occiput appear to extend along the central line of the crown towards the bill, and, possibly, in the very young over the entire head. One specimen at least has the entire head feathered, and in another these extend further along the occiput than in the adults. These are smaller than typical *G. canadensis*, but otherwise quite similar. Mr. Cassin suggests that, in case they may be distinct from the other, they may possibly be referred to *G. cinerea longirostris* of Temminck and Schlegel, figured in the 'Fauna Japonica,' Birds, pl. 72."

Why other than the young of *G. canadensis* I do not perceive; but before reading the above I had arrived at the same conclusion respecting an American crane which was received at the London Zoological Gardens in 1866. A pair were received together, which were quite similar in colouring

of plumage, but the male was very much larger than the female, while the nude and papillose skin upon its head was considerably less extended backwards than in the female, but whether posteriorly furcate or otherwise I neglected to note. My impression is that it was not so, or I should have surely noted it. It was a fully mature bird, and completely accorded with the figure cited, which, however, does not at all agree with the description given in the same work, though both are alike styled by the triple appellation of *Grus cinerea longirostris*. Following the description only, and necessarily without consulting the plate, the latter is assigned by Mr. Dresser (in his "History of the Birds of Europe") to *G. communis*, to which species the description, but not the figure, refers undoubtedly; and on calling that naturalist's attention to the subject, and showing him the figure, he at once pronounced the latter to be that of a species akin to the American Sandhill Crane, from which it differs in its larger size and in the reduced extent of the nude coronal patch, as in the living specimen just described. In the *Proceedings of the Zoological Society* for 1868 (p. 567) Mr. Sclater called attention to the remarkable difference of size noticeable in the two specimens which were then in the Regent's Park collection, but he did not refer to the equally conspicuous difference in the extent of the nude coronal patch. This was noticed, however, by the superintendent, Mr. Bartlett, and when not long ago I showed to him the figure in the "Fauna Japonica," he at once recognised its similarity to, or rather its absolute identity with, the individual bird referred to.

That the figure in question represents a North American specimen, and not a Japanese one, I think there can be exceedingly little doubt, by whatever strange inadvertence it came to be introduced where we find it; and if I had not a vivid recollection of the living bird formerly in the Regent's Park, I should not have hesitated to refer it to *G. communis*. My present and very decided opinion is that it represents a species confounded up to the present time with *G. communis*, to which, therefore, the attention of observers should be directed: as regards mere size, however, Prof. Baird remarks that "there is much variation in different specimens with age: the bill, feet, and whole body apparently growing considerably, long after the perfect feathers have been attained." So far as I have observed, the male is, as usual in the genus, larger than the female; but in the "Exploration and Survey of the Valley of the Great Salt Lake of Utah," by Mr. Howard Stansbury (1852), the length of a female is given as 45in. by 75½in. in expanse of wings, whereas that of a male is given as only 41in. by 69in.

Of presumably the true Sandhill Crane Dr. H. Bryant states that in East Florida:

On the 11th of March a young bird was brought to me which already stood nearly two feet in height; it was covered with down of a ferruginous colour above, and cinereous below; the tarsi were of a reddish-brown colour. The naked skin on the

head was of the same relative extent as in the adult [!], the bill much shorter, and the eyes large and projecting, the whole bird looking very much like a miniature ostrich. The feathers covering the body were about an inch in length, hidden by the down; the quills were about two inches in length. The young remain with their parents until fully grown, and are fed for a long time by regurgitation [!]. They do not fly until they are as large as their parents; but run with great speed, and hide like a young partridge. A nest found on the 11th of March contained two eggs, in which incubation had just commenced; another found on the 15th contained two fresh eggs, and a third on the same date contained two eggs nearly hatched. This is another of the birds whose geographical distribution is especially interesting. It is found breeding all through the lower part of the peninsula of Florida, and again in Wisconsin and the north-west, none being found in the intermediate region except when migrating. (*Proc. Boston Soc. Nat. Hist.*, 1859, p. 14.)

"In Western North America," remarks Prof. Baird, "this is an abundant species, migrating southward in the autumn, and attracting attention by the large numbers in which it appears. Its proper home would seem to be the immense regions of America north of the territory of the United States." Mr. Stansbury observed it "during fall and winter in enormous flocks in the marshes along the Utah Salt Lake. They presented their usual watchfulness and difficulty of approach. No white cranes were seen. It occurs in large flocks throughout the whole interior of North America." According to Mr. Peale, it is "found in great numbers in the latter part of July on the plains of Oregon, and was seen almost daily in the course of our journey to California. It prefers moist open grounds, and roosts generally on small sand bars in the rivers where convenient, but never, that we learned, on trees. Of many thousands of individuals seen by our parties in Oregon and California, we did not observe a single specimen of the Whooping Crane (*G. americana*), although the bird was known to several persons of whom we made inquiry as a rare visitor on that side of the Rocky Mountains." Dr. Pickering mentions that the Sandhill Crane "alights habitually on dry plains and on the hills." It is included without remark in Mr. R. Brown's "Synopsis of the Birds of Vancouver's Island" (*Ibis*, 1868, p. 524). "The only bird worth noticing seen at Pond's Bay, in lat. 72° on the west coast of Baffin's Bay, was a Sandhill Crane. It is rarely met with so far north" (*Ibis*, 1860, p. 167). Doubtless *G. americana* in immature plumage is referred to in the last instance. Capt. L. Sitgreaves, in his "Report of an Expedition down the Zuni and Colorado Rivers" (1853) remarks of the Sandhill or Brown Crane":

This bird I have observed frequently in parts of New Mexico, more abundant, however, on the great Colorado river, where I have seen large flocks congregated; whereas the Whooping Crane (*G. americana*) I have never seen. I found them feeding in the low ground about the lakes and rivers. When frightened by the near approach of a man, one is sure to give the alarm and fly off; he is immediately followed by the whole flock, each one answering the cry of the other, producing anything but an agreeable noise, and circle round in the air until they go to a great height. The

white species appears to confine itself to the sea coast, whereas this bird is found in the interior.

The Sandhill Crane is not unknown in Cuba (*Journ. f. Orn.*, 1871, p. 282). In Mr. Dresser's "Notes on the Birds of Southern Texas" (*Ibis*, 1866, p. 31) it is remarked :

Near Matamoras I never saw the Sandhill Crane, but in our journey from Brownsville to San Antonio, in September, 1863, we saw birds of this species every day. During the winter they were abundant near St. Antonio, but disappeared towards the spring. I shot several, and found them excellent eating—indeed, almost equal in that respect to wild turkeys.

[The most complete description of the distribution and habits of this species with which I am acquainted is the following, given by Dr. Elliot Coues, in the "Birds of the North-West:"]

I find no indication of the occurrence of this species anywhere in the Eastern or Middle States, nor indeed east of the Mississippi and its tributaries, excepting in Florida. There it is abundant, according to several observers. Dr. Bryant refers to its breeding, stating that two eggs are laid, from early in February until about the middle of April. I have met with it in various parts of the West, finding it breeding in Northern Dakota, quite plentifully, on the broad prairie. Newly-hatched young were secured in July, near Turtle Mountain. Late in September and early in October numbers of this species and *G. americana* together were migrating through the same region; they appeared to journey chiefly by night. Often, as we lay encamped on the Mouse River, the stillness of midnight would be broken by the hoarse, rattling croaks of Cranes coming overhead, the noise finally dying in the distance, to be succeeded by the shrill pipe of numberless waders, the honking of geese, and the whistle of the pinions of myriads of wild fowl that shot past, sounding to sleepy ears like the rushing sound of a far away locomotive.

We have accounts of the Sandhill Cranes from the whole extent of the Mississippi Valley (in the broad sense of the term), and of their breeding in Iowa and Minnesota, as well as in Dakota. In Alaska, Mr. Dall says, it is a common bird at St. Michael's and around the mouth of the Yukon, but less so in the interior, as at Nulato. "The eggs, obtained June 17, on the Yukon River, are laid in a small depression on the sandy beach, without any attempt at a nest." He adds that the fibula is a favourite pipe-stem with the Indians, who, also, are fond of domesticating the young; the birds eating up vermin and insects, as well as refuse scraps of food about the settlements. Further south, on the Pacific coast, says Dr. Suckley, Sandhill Cranes are very abundant at Puget Sound, on the Nisqually plains, in autumn. "They there commence to arrive from the summer breeding grounds about the last week in September, from which time until about the 10th of November they are quite plentiful. After this they disappear, probably retiring to warmer latitudes during the cold months. In the fall they are found on all the prairies near Fort Steilacoom, but are not indifferent to choice of certain spots. These are generally old 'stubble-fields,' or spots of ground that have been ploughed. They rise heavily and slowly from the ground on being disturbed, and, flying in circles, at length acquire the desired elevation. When proceeding from one favourite resort to another, or when migrating, the flight is high, and not unfrequently their approach is heralded, before they are in sight, by their incessant, whooping clamour. While feeding they are generally silent." To this account Dr. Cooper adds that the Brown Cranes are common *summer* residents in Washington Territory, "arriving at the Straits of Fuca in large flocks, in April, and there

dispersing in pairs over the interior prairies to build their nests, which are placed amid the tall fern on the highest and most open ground, where they can see the approach of danger. They frequent, at this season, the mountains to the height of 6000 feet above the sea. The young are often raised from the nest by the Indians for food."

"In the autumn and winter," Dr. Newberry observes, "it is abundant on the prairies of California, and is always for sale in the markets of San Francisco, where it is highly esteemed as an article of food. In August we frequently saw them about the Klamath Lakes, and early in September, while in the Cascade Mountains, in Oregon, the Cranes were a constant feature of the scenery of the beautiful but lonely mountain meadows in which we encamped. We found them always exceedingly shy and difficult of approach, but not unfrequently the files of their tall forms stretching above the prairie grass, or their discordant and far-sounding screams, suggested the presence of the human inhabitants of the region, whose territory was now, for the first time, invaded by the white man. The Cranes nest in the alpine meadows, and retreat to the milder climate of the valleys of California on the approach of winter. In Oregon they begin to move southward in October."

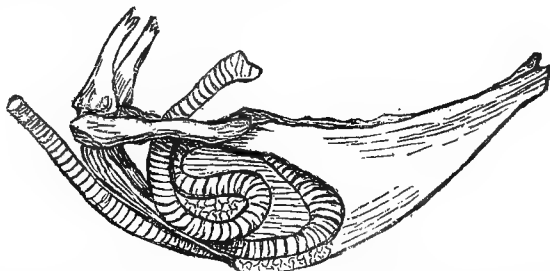
Thousands of Sandhill Cranes repair each year to the Colorado River Valley, flock succeeding flock along the course of the great stream, from their arrival in September until their departure the following spring. Taller than the Wood Ibises or the largest Herons with which they are associated, the stately birds stand in the foreground of the scenery of the valley, the water now reflecting the shadow of their broad wings, then the clear blue sky exhibiting in outline their commanding forms. Such ponderous bodies, moving with slowly-beating wings, give a great idea of momentum from mere weight—of force of motion without swiftness; for they plod along heavily, seeming to need every inch of their ample wings to sustain themselves. One would think they must soon alight fatigued with such exertion, but the raucous cries continue, and the birds fly on for miles along the tortuous stream, in Indian file, under some trusty leader, who croaks his hoarse orders, implicitly obeyed. Each bird keeps his place in the ranks; the advancing column now rises higher over some suspected spot, now falls along an open, sandy reach, swaying meanwhile to the right or left. As it passes on, the individual birds are blended in the hazy distance, till, just before lost to view, the line becomes like an immense serpent gliding mysteriously through the air. When about to alight, fearful lest the shadows of the woods harbour unseen danger, the Cranes pass by the leafy intricacies where the Ibises and other less suspicious birds feed, and choose a spot for the advantage it may offer of uninterrupted vision. By nature one of the most wary and discreet of birds, his experience has taught the Crane to value this gift and put it to the best use. His vigilance is rarely relaxed, even when he is feeding where less thoughtful birds would feel perfectly secure. After almost every bending of his long neck to the ground, he rises erect again, and at full length glances keenly on every side. He may resume his repast, but should so much as a speck he cannot account for appear to view, he stands motionless, all attention. Now let the least sound or movement betray an unwelcome visitor—he bends his muscular thighs, spreads his ample wings, and springs heavily into the air, croaking dismally in warning to all his kind within the far-reaching sound of his voice.

The eggs of the Sandhill Crane are of the same general character as those of *G. americana*, in texture of shell, its colour, and markings, but, to judge from limited comparisons, are usually more elongate, if not also somewhat less capacious—3.80 by 2.60; 3.90 by 2.60; 4.10 by 2.40 (long and narrow); 3.65 by 2.10; the latter remarkably small, as well as unusually narrow. Eggs are in the collection from Liverpool Bay, on the Arctic coast; from Great Slave Lake; from Washington Territory; Fort Crook, California; Lake Simpson, Utah; Iowa, Florida, and Cuba. They cannot be positively distinguished, in any given instance, from those of *G. americana*.

With regard to the trachea of this species Mr. T. S. Roberts, in the *American Naturalist* for 1880, p. 109, writes as follows :

Contrary to the statement of Dr. Elliot Coues, the trachea is convoluted within the keel of the sternum in *G. canadensis* as well as in *G. americana*. This I have determined by the examination of four sterna of *G. canadensis*, three of which were prepared by myself from birds positively identified as *G. canadensis* by the generally recognised external characters. . . . Although there is not such a radical difference as supposed by Dr. Coues, yet the two species are distinct in respect to their trachea and sternal development. A glance at the drawings on page 57 and below will show this at once. They are alike in so far the trachea enters the sternal keel in each. But in *G. canadensis* the whole sternum is smaller and less stoutly developed ; the coils of the windpipe are confined to the anterior half of the keel, and it is in this position alone which is enlarged. There are only about eight inches of windpipe in the keel, and twenty-seven inches in *G. americana* ; the walls of the sternal cavity are much more imperfectly ossified than in *G. americana*, where they are everywhere on the outside dense hard bone. On the whole the entire conformation of the trachea and sternum in *G. canadensis* is much simpler than in *G. americana*.

Although only the anterior portion of the keel is enlarged for the reception of the trachea in *G. canadensis*, yet the remainder of the keel is not solid bone ; but, instead, is composed of two frail plates separated by a thin layer of bony meshwork. This light structure of the posterior part of the keel is more pronounced in some specimens than in others, reaching the greatest development yet seen in a sternum which shows also the greatest convolution of the trachea.



CONVOLUTIONS OF THE TRACHEA IN THE STERNUM OF *GRUS CANADENSIS*.

The specimen figured by Mr. Roberts, an outline of which is here given was selected by him as representing very nearly the average of the four. The entire length of the trachea in *G. canadensis* averages twenty-seven inches.

It is obvious that the extent of the convolutions of the trachea in the various species of cranes depends greatly on age. Mr. Yarrell, in his well-known work on British Birds, gives drawings of the sternum of *G. communis* at two different ages, and Mr. T. Roberts states, p. 112 :

In an embryo Crane stated to be the Sandhill, which was just about to break the shell when collected, the trachea does not enter the sternum at all and is perfectly simple. But the anterior part of the keel, which is, of course entirely cartilaginous and very diminutive is, comparatively speaking, much thickened, and a cross section of it shows it to consist of two thin walls separated by a marrow-like substance. In this feature of the sternum, we see the only indication in the embryo of the singular

structure to be developed later in life. The degree of complexity of the trachea, is thus shown to be dependent upon age, and the variations just alluded to are no doubt fully accounted for by this fact.

The exact relation between the extent of the convolutions and the age of the individual has not been thoroughly worked out. I have recently dissected a Stanley crane, *G. paradisea*, about eight months old, in which the tips of the scapulæ and posterior margin of the sternum are perfectly cartilaginous, and find exactly the same amount of convolution as in Mr. Yarrell's adult specimen, a figure of which is given at page 22, *ante*—W. B. T.]

GRUS SCHLEGELII, BLYTH.

SCHLEGEL'S CRANE.

GRUS SCHLEGELII, Blyth, *Field*, vol. xlii., p. 419. (1873.)

[Mr. P. L. Sclater writes as follows :—

This is a very doubtful species. Schlegel (*Mus. des Pays-Bas*, Ralli, p. 2) refers the specimen figured in the *Fauna Japonica* as *Grus cinerea longirostris* to *Grus canadensis*.

I subjoin Mr. Blyth's short article.—W. B. T.]

G. schlegelii : *G. cinerea longirostris*, Tem. and Sch., "*Fauna Japonica*, Aves," pl. 72, but not the accompanying description, which applies to *G. communis*.

Schlegel's Crane.—Size nearly or quite that of the Common Crane, or conspicuously larger than *G. canadensis*; the plumage exactly as in *G. canadensis*, but the crimson nude skin of the crown developed to only about the same extent as in *G. americana*, and (I think I may venture to assert with confidence) not furcate posteriorly as in *G. canadensis*. Precise habitat unknown, but believed to be some part of North America, and assuredly not Japan, though figured, by some strange mistake, in the "*Fauna Japonica*." I have nothing further to add to what has been stated in the account of *G. canadensis*.

GRUS FRATERCULUS, CASSIN.

GRUS FRATERCULUS, Cass. *Birds of North America*, p. 656, pl. 37. (1860.)

[Mr. P. L. Sclater writes :

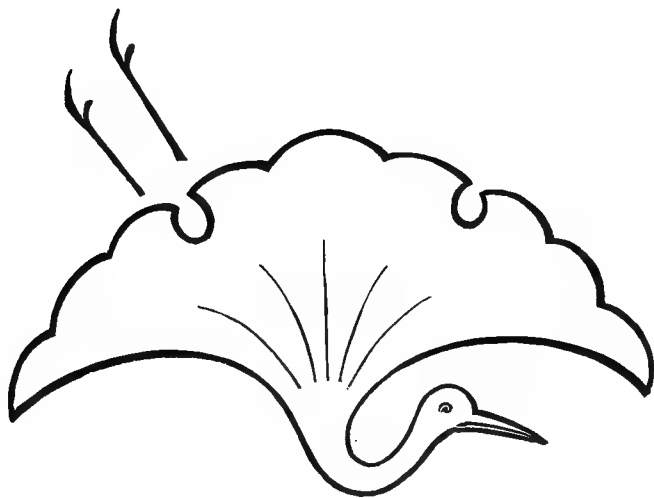
This is likewise a very doubtful species, and probably only a small variety of *Grus canadensis*. See my remarks in the *Proc. Zool. Soc.* 1868, p. 567 (quoted at page 73, *ante*).

Mr. Blyth's account is as follows :]

G. fraterculus, Cassin; young figured in Baird and Cassin's "*Birds of*

North America," pl. 37. American Pigmy Crane. This little known but undoubted species was collected near San Antonio de Bixar, Texas, by Mr. H. E. Dresser, who has favoured me with the following description of his specimen: "Dull blue-grey or ashy blue; feathers on the back edged and washed with dull brown; neck and under parts pure ashy blue; throat and chin very pale; primaries black, shafts white, duller in colour towards the tips; top of head bare to the centre of the crown, or nearly thus far, and covered sparingly with hairs. Culmen, 4·3in.; wing, 17·5in.; tail, 6in.; tarsus, 7·6in.; inner secondaries slightly curved, elongated, extending 3in. beyond the primaries."

There can be little or no doubt that this and the preceding species have been commonly and habitually confounded hitherto with *G. canadensis*; the three being much alike in plumage, but distinguishable by their respective sizes, and doubtless by other details when properly compared together, as by the reduced nude coronal patch of *G. schlegelii* as compared with that of *G. canadensis*.



APPENDIX.

ON THE CONVOLUTIONS OF THE TRACHEA IN BIRDS.

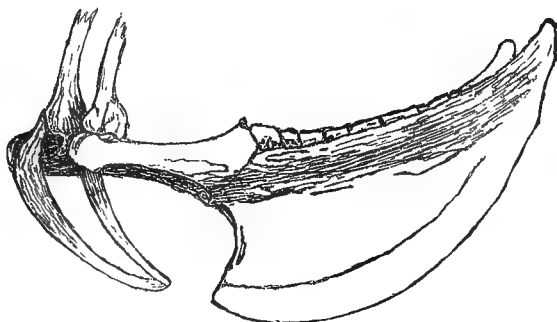
IN preparing this work for the press I have been struck with the singular convolutions of the windpipe that are to be found to a greater or less extent (with a few remarkable exceptions) throughout the species which constitute the well-marked natural family Gruidæ.

In working out the natural history of the different cranes, I endeavoured by actual dissection, when I could obtain recent specimens, or by the study of preparations in museums, to discover the amount of convolution in the tracheæ of the different species. I then essayed to trace the connection between the voice of the bird and the character of the windpipe, and I finally came to the conclusion that the elongation of the windpipe (and the resulting twisting and convolution if it is much elongated) was connected with the deepness of the note and resonance of the sound of the voice. Everyone is acquainted with an ordinary post horn, a keyless conical tube open at both ends. To the smaller end of the tube the lips—which are in this case the vocal organs—are applied, and a note is produced, the pitch and loudness of which depend on the length of the tube. In a short tube the note is high, the resonance small. If the tube is lengthened, as is done in the horn of a mail coach, the note becomes lower, louder, and of greater power of diffusion; and these alterations occur in proportion as the elongation is carried out. But there is a practical limit to the length of a straight horn, inasmuch as it becomes inconvenient to use, and difficult to carry without injury. In the French hunting horn this evil is got rid of by twisting and convoluting the tube, which is curved around the body of the huntsman who blows it.

This is precisely analogous to what occurs in nature in the Cranes. In birds the syrinx, or lower larynx, which is the chief organ of voice, is situated in the interior of the thorax, where the two bronchi, one from each lung, join the lower end of the windpipe; it is here that the vocal cords are situated and the sound is produced, its depth and resonance depending on the length of windpipe along which the vibrations have to pass.

In the Crowned Crane, *Balearica chrysopelargus*, these convolutions are absent, and the sternum is of the usual character, the furcula or merry-thought not being attached to the keel, although there is a very slight depression in the base of the keel in front, where it joins the body of the

bone. In this bird the loud resounding voice of the Cranes is wanting, and the voice is described as a "delightful mellow note."

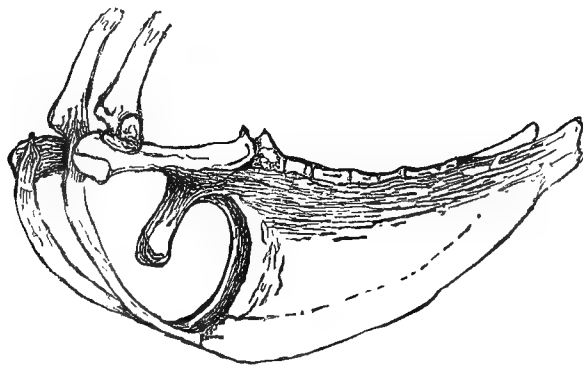


STERNUM OF THE KAFFIR CROWNED CRANE. *Balearica chrysopelargus*.

Of the Western Crowned Crane, *B. pavonina*, I can gain no special information as to the voice, although in Griffith's edition of Cuvier's "Animal Kingdom" it is said to make a noise with its wing (?) somewhat like the sound of a French horn.

In the true Cranes belonging to the genus *Grus* we are informed by Mr. A. O. Hume that one species, the Asiatic White Crane (*G. leucogeranus*), differs remarkably from all the other species in its trachea not being convoluted nor entering into a cavity in the breast bone; that its note is, for so large a bird, a mere chirrup, and even when most alarmed, and soaring round and round, the cry is very feeble as compared with that of any other of the Cranes.

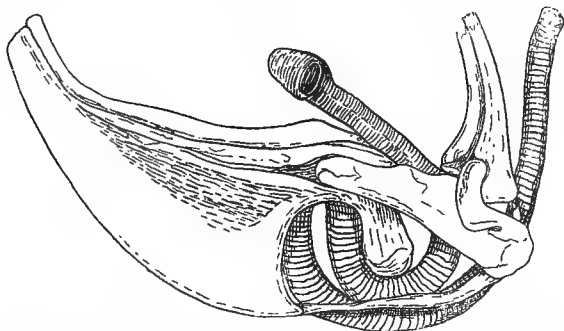
In the Stanley or Paradise Crane, the blue Crane of South Africa (*G. paradisea*) the keel is hollowed out into a cavity open at the sides, as shown in the following sketch from a sternum in the Museum of the



STERNUM OF STANLEY CRANE. *Grus virgo*.

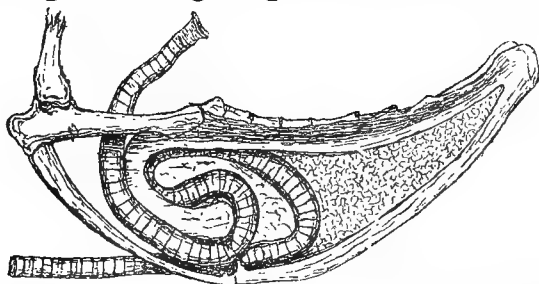
University of Cambridge. The margins of this cavity are deeply grooved for the reception of the trachea, which is disposed as shown in the following figure, which is copied from a drawing by Yarrell in the fifteenth volume of

the "Transactions of the Linnean Society." The voice of this species is described by Mr. Ayres as a loud guttural note, which is uttered when the birds have risen to an immense height in the air.



STERNUM AND TRACHEA OF STANLEY CRANE. *Grus virgo*.

The Saras Crane of India, *G. antigone*, I am fortunate in having had an opportunity of dissecting. The subject of my *post mortem* investigation was an old male that died in the Zoological Gardens, Regent's Park, in 1879. In this species the convolutions of the trachea are carried out to a much greater extent. In the adult the keel of the sternum is formed of two vertical plates, with an interval varying from an inch to half an inch between them. This is partly filled with cancellated, spongy cells, in which the trachea is embedded, gradually becoming more and more convoluted as the bird advances in age. The engraving shows the left side of the keel cut

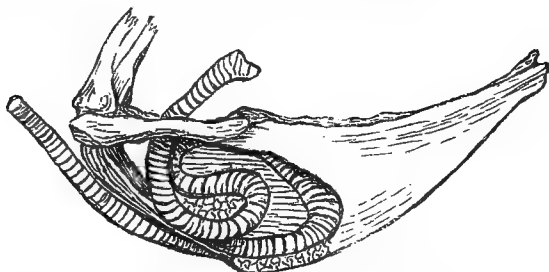


STERNUM AND TRACHEA OF SARAS CRANE. *Grus antigone*.

away, with the trachea curled up within it. It may be noticed that there are four folds of the windpipe contained within the keel, whereas there are only two in the Stanley Crane. For the voice of this Crane I may quote Col. Tickell, who writes: "One of my party having shot a female near the camp, I was distressed throughout the night by hearing the wailing, trumpet tones of the bereaved male calling fruitlessly for the dead."

The Sandhill Crane of North America (*G. canadensis*) has been described as having no convolutions of the trachea within the sternum; but Mr. T. S. Roberts, writing in the *American Naturalist*, 1880, has shown, by the dissection of several specimens, that this view is incorrect, the error possibly

depending on the age of the bird examined. In adult birds the entire length of the trachea is twenty-seven inches, there being about eight or nine inches in the keel, as shown in the diagram.

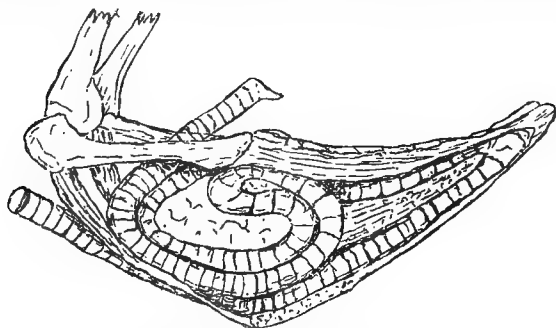


STERNUM AND TRACHEA OF THE SANDHILL CRANE. *Grus canadensis*.

For the voice of this species I will quote from the admirable account given by Dr Elliot Coues in his "Birds of the North-West," in which we are informed that :

When proceeding from one favourite resort to another, or when migrating, the flight is high, and not unfrequently their approach is heralded, before they are in sight, by their incessant, whooping clamour. . . . We found them always exceedingly shy and difficult of approach, but not unfrequently the files of their tall forms stretching above the prairie grass, or their discordant and far-sounding screams, suggested the presence of the human inhabitants of the region, whose territory was now, for the first time, invaded by the white man. . . . Let the least sound or movement betray an unwelcome visitor, the crane spreads his ample wings and springs heavily into the air, croaking dismally in warning to all his kind within the far-reaching sound of his voice.

In the common crane (*G. communis*) the convolutions of the trachea, which are figured in Yarrell's "British Birds," closely resemble those of the saras crane, there being four folds, but the hinder bend passes to the extremity of the keel. The far-resounding voice of this bird is well known.



STERNUM AND TRACHEA OF WHOOPING CRANE. *Grus americana*.

The most extreme development of the trachea in the cranes is to be seen in that one which is frequently termed the whooping crane of America (*G. americana*). It has a windpipe between four and five feet long, of which no less than twenty-eight inches are coiled up in the keel of the breast-bone, as shown in the foregoing diagram.

The windpipe enters the keel below, at the junction of the furcula or merrythought, passes along just above the edge to the extreme end of the bone, then turns forward, and comes to the front along the upper edge of the keel, where it is connected with the horizontal plate of the sternum ; it then turns back again as far as the middle of the keel, again comes forward for a short length, when, curving sharply upwards on itself, it proceeds backwards, then downwards, then forwards, and finally upwards into the interior of the thorax, where it divides into the two bronchi going to the right and left lungs, the syrinx or organ of voice being situated at the bifurcation.

“ Sir John Richardson informs us that the bird flies at such an altitude that its passage is only known by the peculiarly shrill screams it utters—a fact not so remarkable when we consider that the vibrations of sound produced by the syrinx are conveyed through a convoluted trumpet nearly five feet in length.

So much for the convolutions of the trachea in the adult cranes. I think that this account will in the main bear out my suggestion that the result of these elongated curves corresponds to that of those in a French horn—namely, they increase the depth and sound of the voice :

With regard to the young birds, Mr T. J. Roberts informs us that,

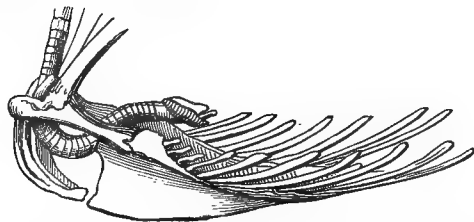
In the embryo crane just about to break the shell the trachea does not enter the sternum at all, and is perfectly simple. But the anterior part of the keel, which is entirely cartilaginous and diminutive, is much thickened, and a cross section of it shows it to consist of two thin walls, separated by a marrow-like substance. In this feature of the sternum we see the only indication in the embryo of the singular structure to be developed later in life. The degree of complexity of the trachea is thus shown to be dependent upon age, and the variations are no doubt fully accounted for by this fact.

As might be expected, in the young birds the voice is entirely wanting in resonance, being a mere plaintive cheep ; and just in proportion as the windpipe becomes more and more convoluted in the adult birds, so does the resonance of the voice become more and more marked, from the feeble tone of the Asiatic white crane, with its straight trachea, through all the various grades up to the resonant clang of the whooping crane of North America.

The convolutions of the trachea in birds are not confined to the Cranes, but are to be found in many other families. In several of the swans (*Cygnus*) the trachea enters into the keel of the sternum very much in the same manner as it does in the Cranes. This, however, as might be expected, is not the case in the tame or mute swan (*Cygnus olor*), which, as its English name implies, is nearly voiceless, and does not even sing as fabled when dying. In other species of the genus, as the Hooper, the *Cygnus musicus* of Bonaparte, the trachea is contained in the keel, as in the Cranes, and the result is that the bird has a loud, melodious, far-reaching, hooping or whooping voice, from which its English name, is derived.

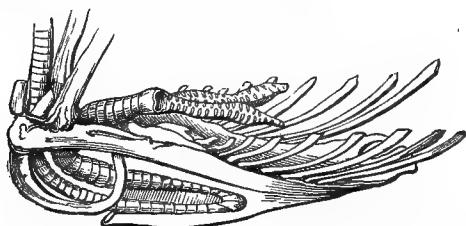
Yarrell says of a very old and large male, that its "note resembled the sound of the word 'hoop,' repeating it loudly ten or twelve times in succession." Low, in his "Natural History of Orkney," says "Like the wild geese, these birds fly in the fashion of a wedge, making a fine melodious clang." Macgillivray says the trachea is 3ft. 2in. in length, and that he has seen, when in Harris, a flock come in from the Atlantic after a gale, and listened with delight to their loud and clear trumpet-like cries as they sped their way in lengthened files.

The accompanying engravings, after Yarrell, show the difference of the sterna and windpipe in the two species.



STERNUM AND TRACHEA OF MUTE SWAN. *Cygnus olor*.

In Bewick's swan (*Cygnus bewicki*) the trachea is convoluted in the keel of the sternum, and, as might be expected, its note is described as having a deep tone, and the bird as being exceedingly clamorous.



STERNUM AND TRACHEA OF HOOPING SWAN. *Cygnus musicus*.

Other birds belonging to perfectly distinct natural families, neither related to the cranes or the swans, are characterised by elongations of the trachea, which are very differently placed.

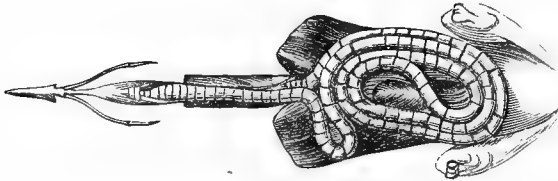
Dr. Latham, in an essay on this subject published in "The Transactions of the Linnæan Society," vol. iv., 1798, figured the tracheas of several birds, as the Guan and others, in which the trachea is convoluted under the skin of the breast, between it and the large pectoral muscles; but these and all previous known examples fade into insignificance when compared with that which occurs in Keraudren's crow shrike (*Manucodia keraudreni*). This, which is a well-marked New Guinea form, is also found in the adjacent parts of Australia. A male specimen from Cape York is to be seen in the British Museum; this is of a uniform brilliant green-black plumage, with slightly lengthened ear-plumes pointing backwards. This specimen is

figured in the supplementary volume of Gould's folio on the Birds of Australia; but of the mode of life, voice, &c., only a very brief account was given, as nothing was known of its habits. Some time since, the following most interesting communication was forwarded to the late Professor Garrod, Prosector of the Zoological Society, whose early death is so deeply deplored by all who knew him or his valuable scientific work. This was placed at my disposal by his successor, Mr. W. A. Forbes, and I have much pleasure in publishing what I believe to be the first account of the habits of this extraordinary species. The writer, whose name unfortunately is not on the manuscript, and to whom therefore I cannot give the credit which is his due, states:

"Having recently purchased a pair of those elegant birds, the *Manucodia keraudreni*, which had been shot at Cape York by Mr. J. A. Thorpe (now Taxidermist to the Sydney Museum), he directed my attention to the peculiar formation of the trachea in them, some of which he had preserved in a dried state and presented to me. Of these I have sent you three, one female and two from males; that of the female is much smaller in size than those of the males; and even in the males the convolutions assume different forms, some being perfectly cylindrical, others are very much elongated; the convolutions are very numerous and large in comparison with the size of the bird, and constitute a singular formation. By moistening the specimens I have sent, you will be able to observe more accurately the peculiarity of the structure, and the elasticity and power of contraction and dilatation of the tube, than can be done by an examination of the dried specimens. If you consider them of sufficient interest, they could be drawn and brought before the Society. I shall make every effort to procure some of these birds in spirits, so as to enable an accurate dissection of this formation to be made and described. From Mr. Thorpe's account, the trachea forms the convolutions between the skin and breast (but not on the bone itself), and then enters the cavity of the chest to the lungs. This formation of the vocal organs enables the male bird to utter a very loud and deep guttural sound—indeed, more powerful and sonorous than anyone would suppose so small a bird could be capable of producing. Mr. Thorpe states to me that it was a long time before he could believe that so powerful a sound emanated from this bird. No information could be obtained respecting the note of the female, as only that of the male bird was heard. Mr. Thorpe gave me some information respecting the habits of these birds, as follows: "During a residence of seventeen months at Cape York in 1867-68, I shot several of the *Manucodia keraudreni*, and took particular notice of their habits. They frequent the dense palm forests, and are usually seen high up in the trees; they utter a very deep and loud guttural note, rather prolonged, and unlike that of any other bird with which I am familiar. Their movements are particularly active and graceful; on

approaching them they evince more curiosity than timidity, looking down at the slightest noise, and apparently more anxious to obtain a full view of the intruder than for their own safety. They are almost invariably in pairs, and both birds can generally be secured."

I have seen and examined the tracheæ sent by Prof. Garrod's correspondent, but, being in a dry state, they do not give so good an idea of the wonderful complexity of the convolutions as the following woodcut, reduced from a lithograph accompanying an article by Professor Pavesi, of the



CONVOLUTIONS OF TRACHEA ON THE BREAST OF KERAUDREN'S CROW SHRIKE.

University of Genoa, which appeared in the "*Annali del Museo Civico*," vol. vi.

That a bird the size of a missel-thrush should be able to produce a sound so loud as that described is, I think, a conclusive proof that the effect of the elongation and convolution of the trachea is the deepening of the tone and the increase of the loudness of the voice, which is the proposition that I have endeavoured to demonstrate; but why certain birds should require such a deep-toned and far-reaching voice, which is not possessed by closely allied species, is a matter still to be determined.

INDEX.

(Synonyms are printed in *italics*.)

	PAGE		PAGE
<i>Antigone carunculata</i>	33	Barratt, Mr. F. A., Crowned Crane .	18
" <i>leucauchen</i>	35	" " Stanley Crane .	26
" <i>leucogeranus</i>	38	Bartlett, Mr., Nesting of Manchurian	
" <i>monachus</i>	71	Crane	7
" <i>montigenesia</i>	53	Bennett, Mr. E. T., Species of Balearica	
" <i>torquata</i>	45	Crane	13
Albin, <i>Grus communis</i>	60	Blakiston and Pryer on <i>G. leucauchen</i>	37
Alcock, Sir Rutherford, Japanese		Blanford, Mr. W. T., Cranes in Persia	65
Cranes	36	Blue Crane	23
Andersson, C. J., Crowned Crane .	17	Bree, Dr., Balearica pavonina . . .	20
" Stanley Crane	25	" Eggs of Demoiselle Crane	32
" Wattled Crane	34	Brooks, Mr. W. E., <i>G. leucogeranus</i> .	39
<i>Anthropoides</i>	16, 23	Bryant, Dr. H., Sandhill Crane . .	73
" <i>pavonina</i>	19	Buckley, Mr. T. C., Nest of Crowned	
" <i>pavoninus</i>	15, 19	Crane	18
" <i>regulorum</i>	15	<i>Bugeranus carunculatus</i>	33
" <i>stanleyanus</i>	23	Burgess, Lieut., Demoiselle Crane .	29
" <i>virgo</i>	26	Caffre Crane	33
<i>Ardea americana</i>	54	Chesney, Col., Habits of Crane . .	8
" <i>antigone</i>	47	Claw, Hooked Inner, of Cranes . .	2
" <i>canadensis</i>	72	Collared Crane	45
" <i>carunculata</i>	33	Convulsions of Trachea.	81
" <i>chrysopelargus</i>	15, 16	Cordeaux, Mr., on Fen Laws . . .	11
" <i>gigantea</i>	38	Coues, Dr. Elliot, Eggs of <i>G. americana</i>	
" <i>grus</i>	59	Crane	55
" <i>palearis</i>	33	" " " Sandhill Crane .	75
" <i>paradisea</i>	23	Crane, American Pigmy	79
" <i>pavonina</i>	19	" " White	54
" <i>virgo</i>	26	" Asiatic White	38
Audubon, American Cranes . . .	56	" Australian	57
Ayres, Mr. T., Crowned Crane . .	18	" Black-necked	70
" Stanley Crane	25	" Blue	23
" Wattled Crane	34	" Brown	72
Baird, Prof., <i>Grus canadensis</i> .	72, 73	" Caffre	33
Balearic Crane	19	" Common	59
Balearica	14	" Crowned, Southern	15
" <i>chrysopelargus</i>	15	" " Western	19
" <i>pavonica</i>	16	" Greater Indian.	47
" <i>pavonina</i>	19	" Kaffir	15
" <i>regulorum</i>	15	" Manchurian	53

	PAGE		PAGE
Crane, Sandhill	72	<i>Grus collaris</i>	45, 53
„ Schlegel's	78	„ <i>communis</i>	59
„ Value as Food	10	„ <i>communis</i> , var. <i>orientalis</i>	59
„ Wattled	33	„ <i>fraterculus</i>	78
„ White Headed	71	„ <i>fusca</i>	72
„ White	54	„ <i>gigantea</i>	38
„ Whooping	54	„ <i>hoyianus</i>	54, 55
„ White Naped	35	„ <i>japonensis</i>	35, 53
Cranes, Affinities of	11	„ <i>leucauchen</i>	35
„ Breeding of	5	„ <i>leucogerana</i>	38
„ Food of	4	„ <i>leucogeranus</i>	38
„ General Habits	2	„ <i>longirostris</i>	63
„ Pairing of	4	„ <i>mexicana</i>	72
„ Popular Names of	1	„ <i>minor albus</i>	35
Crowned Crane, South African	15	„ <i>monacha</i>	71
„ „ West African	19	„ <i>monachus</i>	71
Cullen, Dr. A. S., Nesting of Demoiselle	30	„ <i>montigenesia</i>	53
Cutler, Mr. T. W., Drawings of Japanese Cranes	37	„ <i>nigricollis</i>	70
Cygnus musicus	86	„ <i>numidica</i>	26
„ „	86	„ <i>orientalis indica</i>	47
Demoiselle Crane	26	„ <i>paradisea</i>	23
„ de Numidie	26	„ <i>poliophœa</i>	72
Dresser, Mr. H. E., Balearica pavonina	20	„ <i>pratensis</i>	72
„ „ Demoiselle Crane	27	„ <i>primigenia</i>	13
„ „ <i>G. americana</i>	58	„ <i>schlegelii</i>	78
„ „ <i>G. communis</i>	61	„ <i>struthio</i>	54
„ „ <i>G. fraterculus</i>	79	„ <i>torquata</i>	45, 46
„ „ Sandhill Crane	75	„ <i>vipio</i>	35
Eggs of the Cranes	6	„ <i>virgo</i>	26
Elliot, Sir Walter, Demoiselle Crane	30	„ <i>viridirostris</i>	53
Flower, Prof., Demoiselle Crane	30	„ <i>viridirostris</i> , Nesting of	7
<i>Geranus paradiseus</i>	23	„ <i>vulgaris</i>	59
Gloger, Wattled Crane	34	Gurney, Mr. J. H., Crowned Crane	19
Gould, Mr., on Australian Crane	51	Harting, Mr. J. E., Migration of Cranes	65
Grue à Collier	45, 46	Hind, Mr. H. Y., Wounded Crane killing Hunter	2
„ Blanche d'Amerique	54	„ „ <i>G. americana</i>	58
Gruidae, affinities of	12	Hume, Mr. A. O., <i>G. leucogeranus</i>	39, 45
„ Genera of	11	Irby, Major L. H., <i>G. leucogeranus</i>	46
<i>Grus americana</i>	54	Jerdon, Dr., Demoiselle Crane	28, 29
„ <i>antigone</i>	35, 47	„ „ <i>G. antigone</i>	47
„ <i>australasianus</i>	51	Kæmpfer, on Japanese Cranes	38
„ <i>balearica</i>	21	Kaffir Crane	15
„ <i>canadensis</i>	72	Karan	35
„ <i>capensis</i>	23	Keraudren's Crow Shrike	86
„ <i>carunculata</i>	33	<i>Laomedontia carunculata</i>	33
„ characters of	23	Layard, Mr. E. L., Crowned Crane	17
„ <i>cineracea</i>	59	„ „ Stanley Crane	25
„ <i>cinerea</i>	59	„ „ Wattled Crane	34
„ <i>cinerea longirostris</i>	72, 78	<i>Leucogeranus giganteus</i>	38
		<i>L'Oiseau Royal</i>	15

	PAGE		PAGE
Lichtenstein, A. A. H., on Crowned Crane	15	Sclater, Mr. P. L., <i>G. leucauchen</i>	35
Long, Major, Flight of Sandhill Crane	2	" " <i>G. viridirostris</i>	53
Mâhem	18	<i>Scops paradiseus</i>	23
Manucodia keraudreni	86	" <i>virgo</i>	26
M'Arthur, Mr. J., Domesticated Australian Crane	10	Seeböhm, Mr. H., <i>G. leucogeranus</i>	44
Milton, Flight of Crane	3	Sitgreaves, Capt., Sandhill Crane	74
Native Companion	57	Stanley Crane	23
Nesting of Cranes	6	Storks, name erroneously applied to Cranes	1
Newton, Prof., Affinities of Gruidæ	13	Stork, White	54
" " Migration of <i>G. communis</i>	65	Swan, Trachea in	86
Nordmann, Prof., Demoiselle Crane	30	Swinhoe, Consul, <i>G. viridirostris</i>	54
Ortlepp, Mr., Food of Stanley Crane	25	Syrus Crane	47
Pallas, White Naped Crane	36	Tancho	35, 37
Paradise Crane	23	Tegetmeier, W. B., name of <i>B. chrysopelargus</i>	16
Parker, Mr. W. K., Affinities of Gruidæ	12	" Trachea of <i>G. antigone</i>	51
Pennant <i>G. communis</i>	60	" " Convolutions of Trachea	81
Prjevalski, Lt.-Col., <i>G. communis</i>	64	<i>Tetrapteryx capensis</i>	23
" " <i>G. leucauchen</i>	37	Tickell, Col., <i>G. antigone</i>	48
" " <i>G. nigricollis</i>	70	" " <i>G. communis</i>	61
" " <i>G. monacha</i>	71	Tristram, Canon, Cranes in the Holy Land	64
Range of Gruidæ	3	" " Roosting of Common Crane	9
Richardson, Sir J., <i>G. americana</i>	57	Usher, Mr. H. T., Western Crowned Crane	21
Roberts, Mr. T. S., Trachea of American Cranes	57, 77	Viéillot, <i>G. collaris</i>	46
Saras	47	Virgil, Voice of Crane	3
Sárás Crane	45	Wattled Crane	33
Saunders, Mr. Howard, <i>Balearica pavonina</i>	20	Wright, Mr. C. L., <i>Balearica pavonina</i>	20
Sclater, Mr. P. L., <i>G. canadensis</i>	72, 73	Wolley, Mr. J., Breeding of Crane	66
" " <i>G. collaris</i>	45	Yarrell, Stanley Crane	24
" " <i>G. fraterculus</i>	78		

POSTSCRIPT.

THE work, which has occupied so much of my leisure time during the last two years, is finished. When, twelve months since, I asked my friend Wallis MacKay to give me a sketch for the verse from Shelley with which I purposed to conclude this volume, I did not know how painfully appropriate it would be, nor how many of my friends would have found that "place of peace" before the work was concluded.

The crane o'er seas and forests seeks her home;
No bird so wild but has its quiet nest,
When it no more would roam;
The sleepless billows on the ocean's breast
Break like a bursting heart, and die in foam,
And thus at length find rest.
Doubtless there is a place of peace,
Where *my* weak heart and all its throbs will cease.



FINIS CORONAT OPUS.

